



US005164897A

**United States Patent** [19][11] **Patent Number:** **5,164,897**

Clark et al.

[45] **Date of Patent:** **Nov. 17, 1992**[54] **AUTOMATED METHOD FOR SELECTING PERSONNEL MATCHED TO JOB CRITERIA**

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[73] Assignee: Techpower, Inc., Minneapolis, Minn.

[21] Appl. No.: 369,650

[22] Filed: Jun. 21, 1989

[51] Int. Cl.<sup>5</sup> ..... G06F 15/21

[52] U.S. Cl. .... 364/401

[58] Field of Search ..... 364/401

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Primary Examiner—Dale M. Shaw

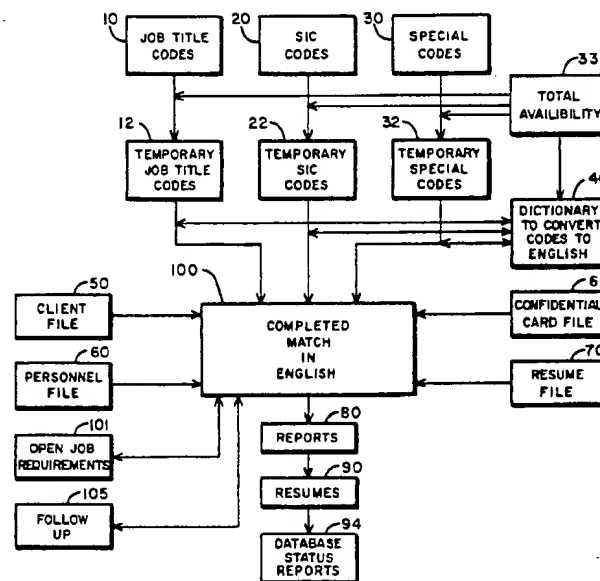
Assistant Examiner—David Huntley

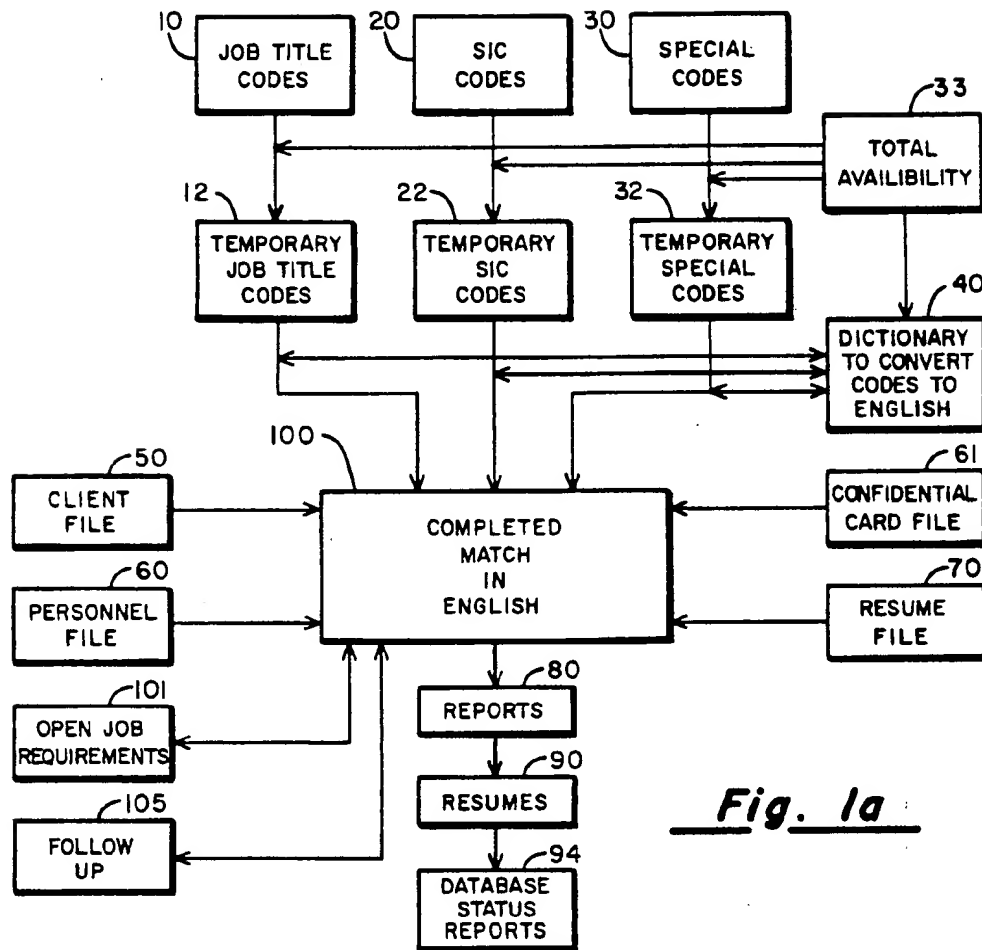
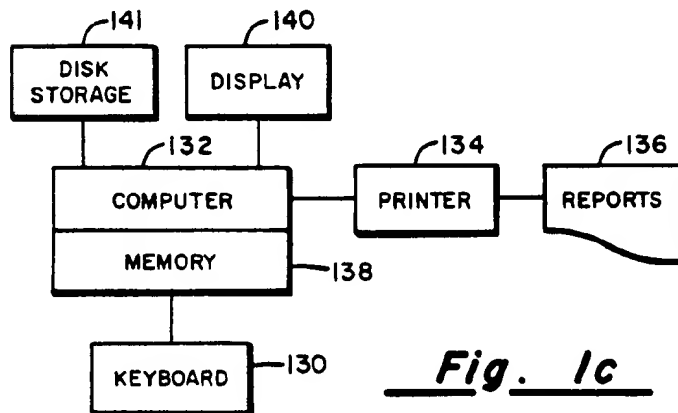
Attorney, Agent, or Firm—Leone & Moffa

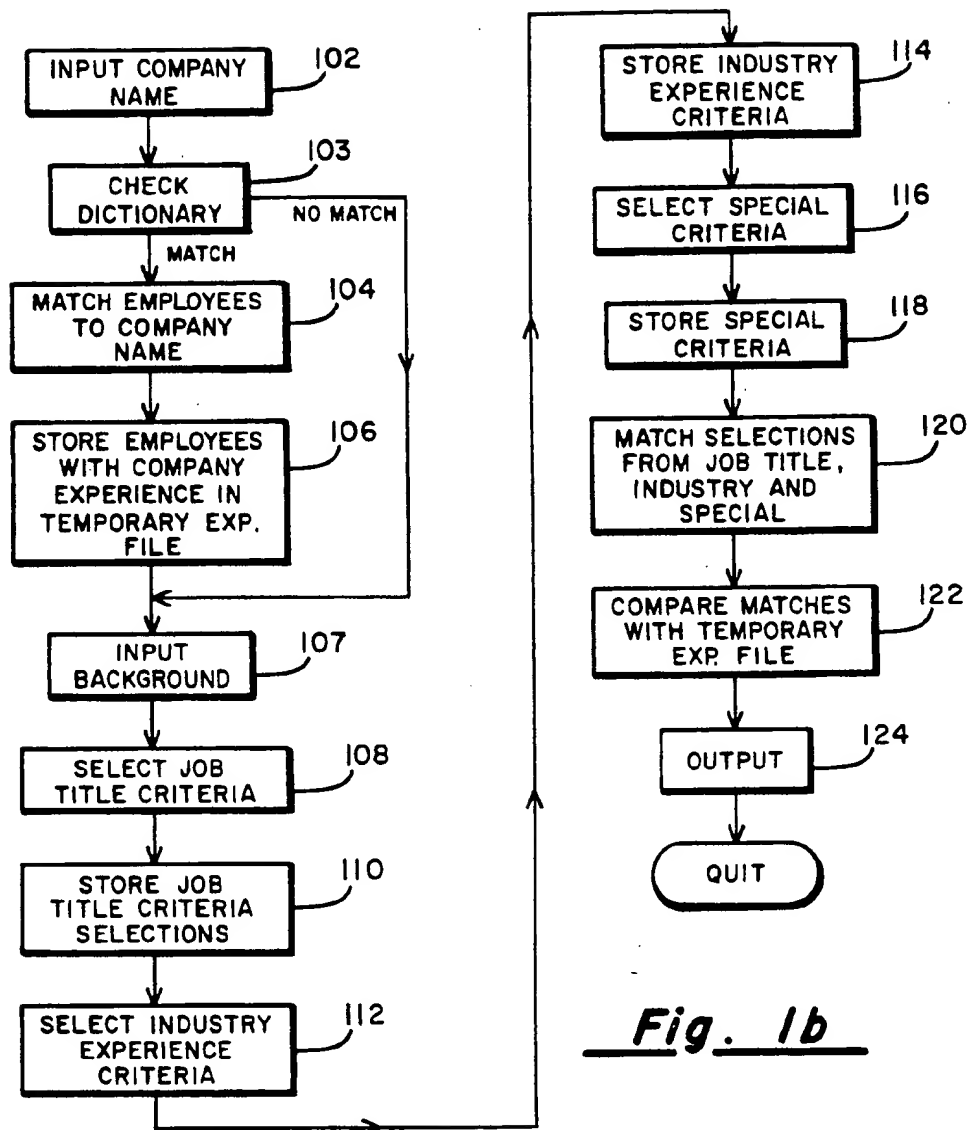
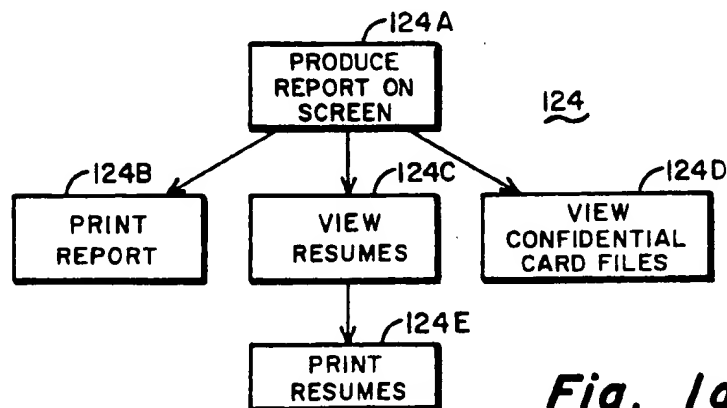
[57] **ABSTRACT**

An automated method for selecting personnel which includes the step of selecting a first set of employees having qualifications matching a first job criteria from a first data file where the first data file includes a first plurality of records and each record includes a first job selection criteria, such as job titles, and a corresponding employee code. A second step comprises selecting a second plurality of employees having qualifications matching a second job criteria from a second data file which includes a second plurality of records wherein each record includes a second job selection criteria, such as industrial experience, and a corresponding employee code. In the preferred embodiment, a third selection is made from yet a third data file including records having a third job selection criteria, such as special skills, with a corresponding employee code. This results in three groups of selected records. The method of the invention then requires selecting the records of those personnel whose employee codes occur at least once in each of the three employee sets.

3 Claims, 21 Drawing Sheets



Fig. 1aFig. 1c

Fig. 1bFig. 1d

TECHPOWER/HI TECH PLACEMENT- SEARCH POWER
WELCOME TO THE TECHPOWER MATCH SYSTEM
ENTER FIRST 3 LETTERS OF YOUR COMPANY

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**Fig. 2a**

<p>201a</p> <p><b>JOB CLASS SELECTIONS</b></p> <p>ELECTRONIC DIGIT-(71)</p> <p>1 OF 3 JOBS USED</p>	<p>201b</p> <p><b>INDUSTRY SELECTIONS</b></p> <p>COMPUTERS/MICROP-(275)</p> <p>1 OF 3 INDUSTRIES USED</p>	<p>201c</p> <p><b>SPECIAL SELECTIONS</b></p> <p>MOTOROLA-(23) MACINTOSH COMPUT-(13)</p> <p>2 OF 3 SPECIALS USED</p>
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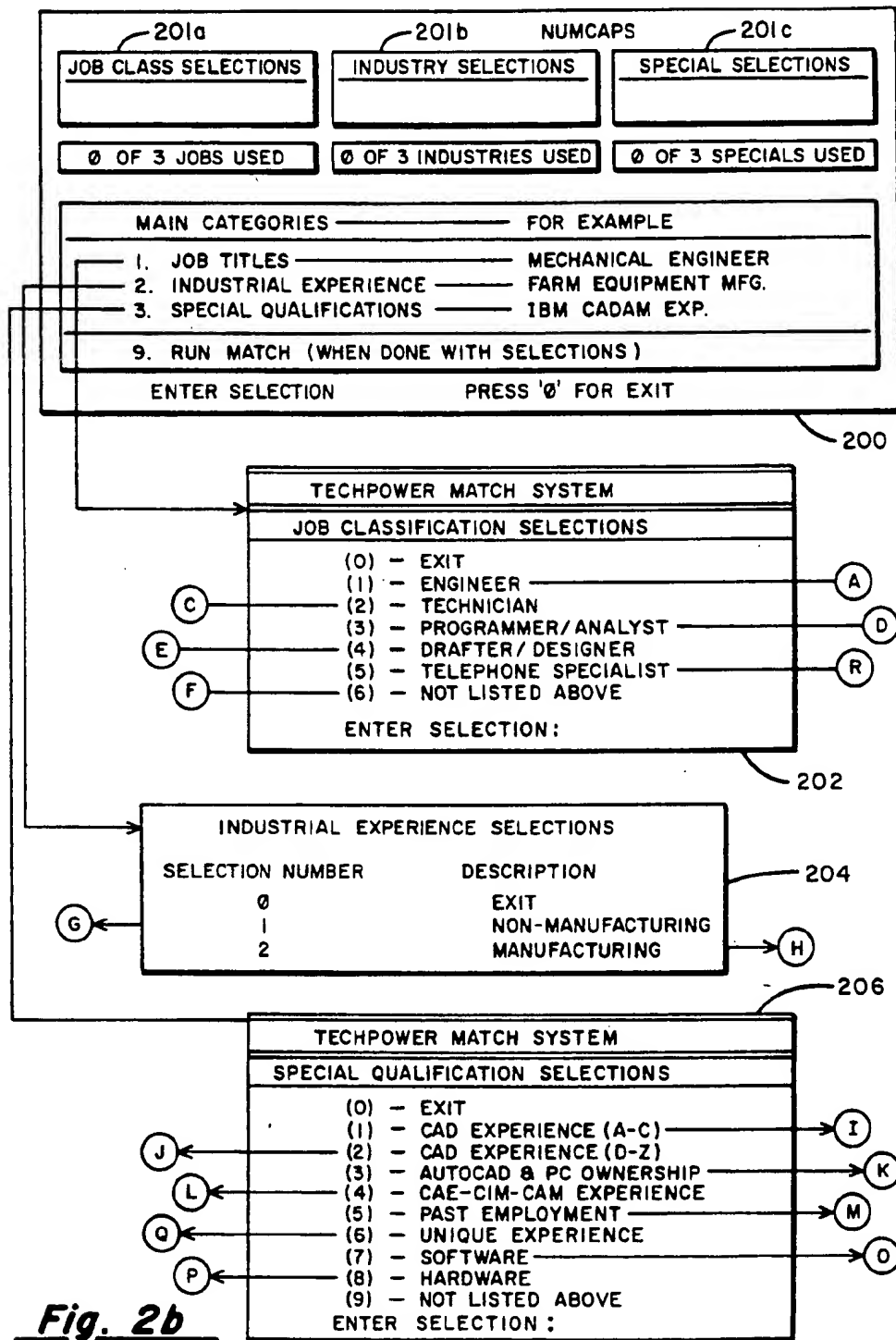
NUMCAPS

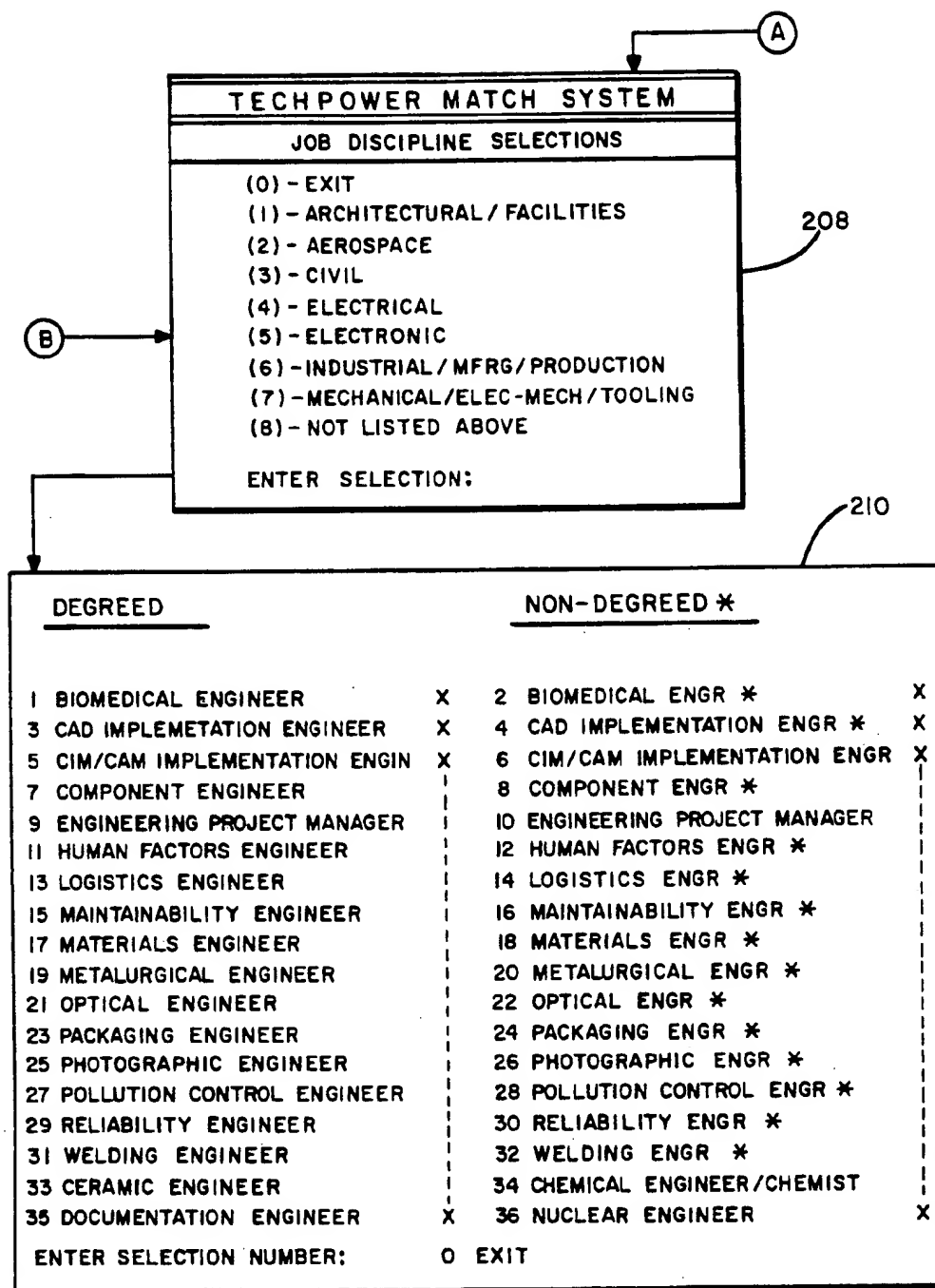
MAIN CATEGORIES _____ FOR EXAMPLE	
1. JOB TITLES _____	MECHANICAL ENGINEER
2. INDUSTRIAL EXPERIENCE _____	FARM EQUIPMENT MFG.
3. SPECIAL QUALIFICATIONS _____	IBM CADAM EXP.
9. RUN MATCH (WHEN DONE WITH SELECTIONS)	

ENTER SELECTION      PRESS 'O' FOR EXIT

200

**Fig. 2c**

**Fig. 2b**

Fig. 3a

212			
<u>DEGREED</u>		<u>NON-DEGREED *</u>	
1 ARCHITECT	X	2 LANDSCAPE ARCHITECT	X

214			
<u>DEGREED</u>		<u>NON-DEGREED *</u>	
1 AERONAUTICAL ENGINEER	X	2 AERONAUTICAL DESIGN ENGR *	X

216			
<u>DEGREED</u>		<u>NON-DEGREED *</u>	
1 CIVIL ENGINEER	X	2 CIVIL DESIGN ENGR *	X
3 CIVIL-STRUC ENGINEER GROUP	X	4 CIVIL-STRUC DESIGN GROUP *	X
5 CONSTRUCTION ENGINEER	X	6 CONSTRUCTION ENGR *	X
7 STRUCTURAL ENGINEER	X	8 STRUCTURAL DESIGN ENGR *	X

217			
<u>DEGREED</u>		<u>NON-DEGREED *</u>	
1 ELECTRICAL ENGINEER GROUP	X	2 ELECTRICAL DESIGN GROUP *	X
3 ELECTRICAL POWER ENGINEER	X	4 ELECTRICAL POWER DESIGN ENGR	X
5 ELECTRICAL SPECIAL ENGR GROUP	X	6 ELEC SPECIAL ENGR GROUP *	X
7 ELECTRICAL START-UP ENGINEER	X	8 ELECTRICAL START-UP ENGR *	X

(B) 218			
<u>DEGREED</u>		<u>NON-DEGREED *</u>	
1 ELECTRONIC ANALOG ENGINEER	X	2 ANALOG DESIGN ENGR *	X
3 ELECTRONIC COMPONENT ENGINEER	X	4 ELECTRONIC COMPONENT ENGR *	X
5 ELECTRONIC DIGITAL ENGINEER	71	6 DIGITAL DESIGN ENGR *	X
7 ELECTRONIC LOGIC ENGINEER	X	8 LOGIC DESIGN ENGR *	X
9 ELECTRONIC MFRG ENGINEER	X	10 ELECTRONIC MFRG ENGR *	X
11 ELECTRONIC QUALITY ENGINEER	X	12 ELECTRONIC QUALITY ENGR *	X
13 ELECTRONIC TEST ENGINEER	X	14 ELECTRONIC TEST ENGR *	X
15 I & C ENGINEER	X	16 I & C ENGR *	X
17 BSET, BSIT	X	18 PHYSICIST	X

Fig. 3b

220

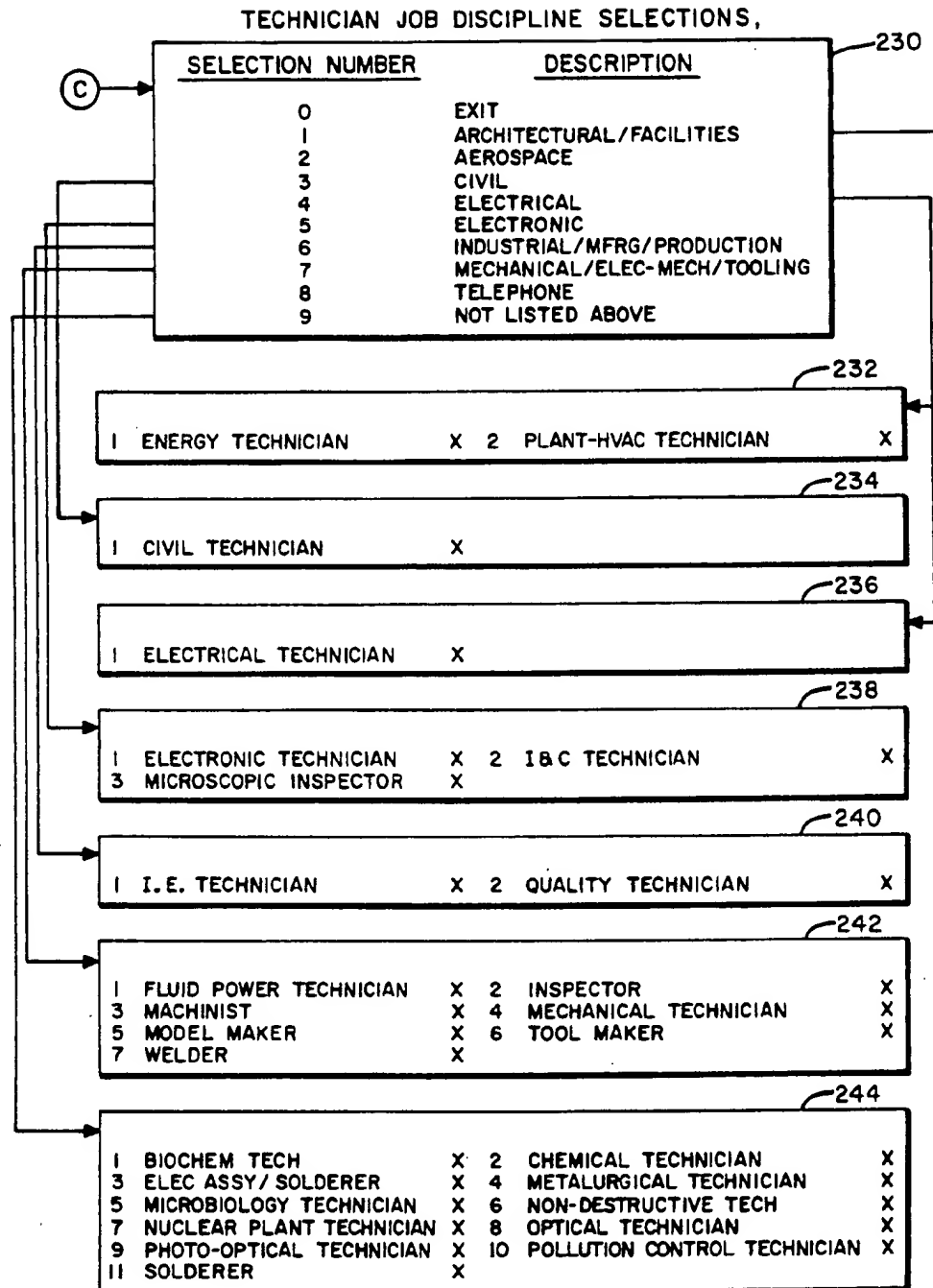
<u>DEGREED</u>		<u>NON- DEGREED *</u>			
1	CONFIGURATION ENGINEER	X	2	CONFIGURATION ENGR *	X
3	COST ESTIMATING ENGINEER	X	4	COST ESTIMATING ENGR *	X
5	FACILITIES PLANNER ENGINEER	X	6	FACILITIES PLANNER ENGR *	X
7	INDUSTRIAL ENGINEER		8	INDUSTRIAL ENGR *	
9	MANUFACTURING ENGINEER		10	MANUFACTURING ENGR *	
11	MATERIAL PLANNING ENGINEER		12	MATERIAL PLANNING ENGR *	
13	N-C PROGRAMMER		14	N C PROGRAMMER *	
15	PROCESS ENGINEER GROUP		16	PROCESS ENGR GROUP *	
17	PRODUCTION ENGINEER		18	PRODUCTION ENGR *	
19	PRODUCTION SCHEDULER		20	PRODUCTION SCHEDULER *	
21	QA START-UP ENGINEER		22	QA START-UP ENGR *	
23	QUALITY ENGINEER		24	QUALITY ENGR *	
25	SAFETY ENGINEER		26	SAFETY ENGR *	
27	TOOLING PLANNING ENGINEER		28	TOOLING PLANNER ENGR *	X
29	CONFIGURATION ENGR *	X			

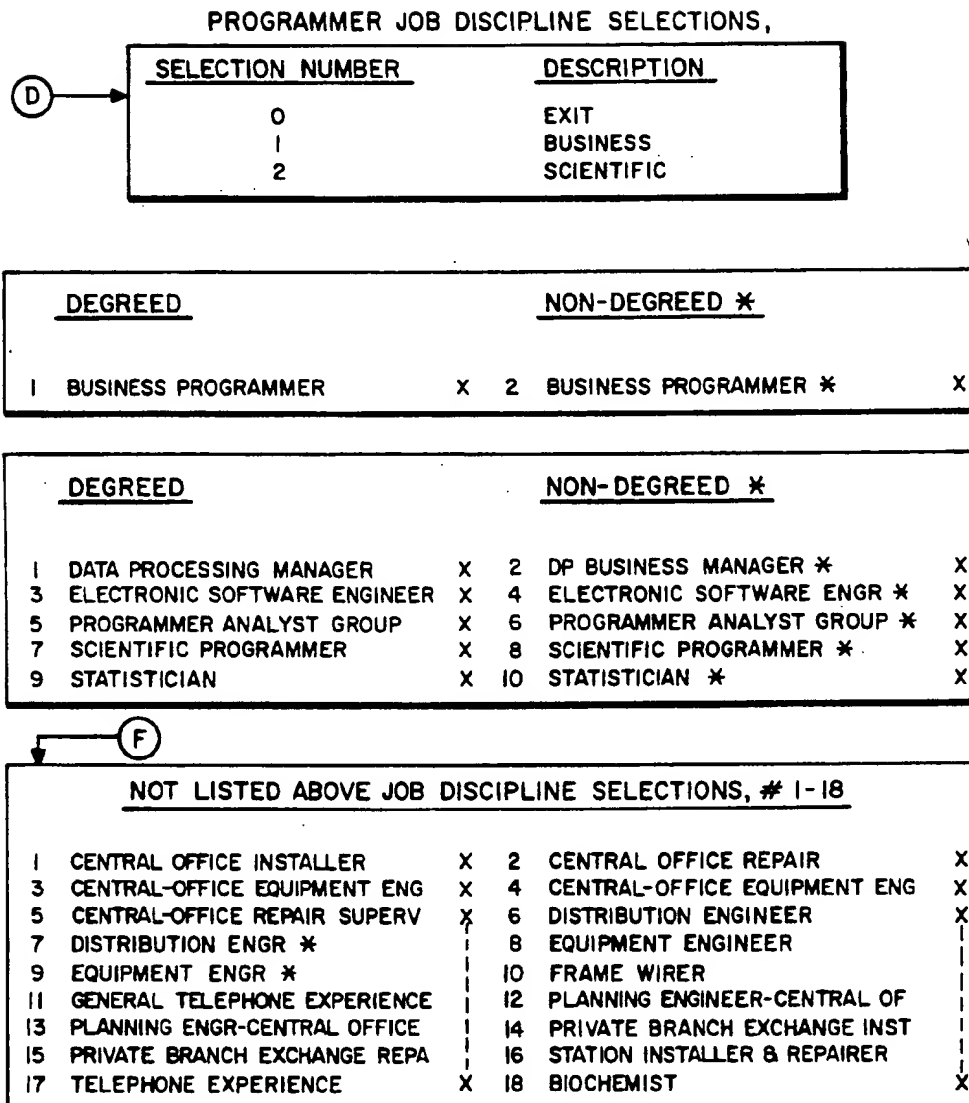
222

<u>DEGREED</u>		<u>NON- DEGREED *</u>			
1	HEAT TRANSFER ENGINEER	X	2	HEAT TRANSFER ENGR *	X
3	MECHANICAL HVAC ENGINEER	X	4	HVAC-FACILITIES DESIGN ENGR	X
5	MECHANICAL START-UP ENGINEER		6	MECHANICAL START-UP ENGR *	
7	PLANT ENGINEER		8	PLANT ENGR *	
9	E-M PACKAGING ENGINEER		10	MECHANICAL ENGINEER	
11	MECHANICAL ENGINEER GROUP	X	12	TOOLING ENGINEER	X

**Fig. 3c**



Fig. 3d

Fig. 3e

## DRAFTING JOB DISCIPLINE SELECTIONS \*

(E) →

SELECTION NUMBER	DESCRIPTION
0	EXIT
1	ARCHITECTURAL/FACILITIES
2	AEROSPACE
3	CIVIL
4	ELECTRICAL
5	ELECTRONIC
6	INDUSTRIAL/MFRG/PRODUCTION
7	MECHANICAL/ELEC-MECH/TOOLING
8	TELEPHONE
9	NOT LISTED ABOVE

1	ARCHITECTURAL DESIGNER	X	2	ARCHITECTURAL DRAFTER	X
3	HVAC DRAFTER	X	4	LANDSCAPE DESIGNER	X
5	LANDSCAPE DRAFTER	X	6	PIPING DESIGN-DRAFTER	X
7	PLANT LAYOUT DRAFTER	X	8	PLUMBING DRAFTER	X
9	SPRINKLER DESIGN DRAFTER	X			

1	CARTOGRAPHIC DRAFTER	X	2	CIVIL DRAFTER	X
3	CIVIL-STRUC DRAFTER GROUP	X	4	STRUCTURAL DRAFTER	X

1	ELECTRICAL DRAFTER	X
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1	ELEC DRAFTER GROUP	X	2	ELECTRONIC DRAFTER	X
3	PRINTED CIRCUIT DESIGNER	X			

Fig. 3f

1	CHECKER	X	2	DETAIL DRAFTER GROUP	X
3	E-M PACKAGING DESIGNER	X	4	ELECTRO-MECHANICAL DRAFTER	X
5	LAYOUT DRAFTER GROUP		6	MECHANICAL DESIGNER	
7	MECHANICAL DESIGNER GROUP		8	MECHANICAL DETAIL DRAFTER	
9	MECHANICAL LAYOUT DRAFTER		10	TOOLING DESIGNER	X
11	TOOLING DRAFTER	X			

1	GRAPHIC DESIGNER	X	2	GRAPHIC DESIGNER *	X
3	INDUSTRIAL DESIGNER	X	4	INDUSTRIAL DESIGNER *	X
5	INTERIOR DESIGNER	X	6	INTERIOR DESIGNER *	X
7	PROPOSAL WRITER		8	PROPOSAL WRITER *	
9	PURCHASING/BUYER		10	PURCHASING / BUYER *	
11	SALES ENGINEER		12	SALES ENGR *	
13	TECHNICAL EDITOR		14	TECHNICAL EDITOR *	
15	TECHNICAL WRITER		16	TECHNICAL WRITER *	
17	DRAFTING/CONTROL CLERK		18	COMPUTER OPERATOR *	
19	TECHNICAL ILLUSTRATOR	X	20	INSTRUCTOR *	X

Fig. 3g

(R) →

TECHPOWER MATCH SYSTEM	
JOB DISCIPLINE SELECTIONS	
(0) - EXIT	
(1) - ALL TELEPHONE PEOPLE	
(2) - OSP	
(3) - STATION	
(4) - PBX	
(5) - COE	
(6) - COMPUTER	
(7) - INSTRUCTION	
ENTER SELECTION :	

Fig. 3h

## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, # 1-1

	TOTAL # AVAIL PEOPLE	TOTAL # AVAIL PEOPLE
1 TELEPHONE EXPERIENCE	1	

ENTER SELECTION NUMBER: 0 EXIT

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## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, # 1-8

	TOTAL # AVAIL PEOPLE		TOTAL # AVAIL PEOPLE
1 CABLE PLACEMENT TECHNICIAN	0	2 CABLE SPLICER INSTALLATION	0
3 CABLE SPLICER REPAIR	0	4 CABLE SPLICER FIBER	0
5 CONSTRUCTION SUPERVISOR	0	6 DISTRIBUTION ENGINEER-ASSO	0
7 DISTRIBUTION ENGINEER	0	8 DISTRIBUTION ENGINEER-PLAN	0

ENTER SELECTION NUMBER: 0 EXIT

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**Fig. 3i**

## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, # 1-8

	TOTAL # AVAIL PEOPLE		TOTAL # AVAIL PEOPLE
1 REPAIR CLERK	0	2 STATION EQUIPMENT TECH. INSTA	0
3 STATION EQUIPMENT TECH.-RE	0	4 STATION KEY EQUIPMENT TECHNI	0
5 STATION EQUIPMENT-COIN	0	6 STATION EQUIPMENT- DATA	0
7 MOBILE RADIO CELLULAR	0	8 TECHNICIAN CABLE TV	0

ENTER SELECTION NUMBER: 0 EXIT

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## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, # 1-6

	TOTAL # AVAIL PEOPLE		TOTAL # AVAIL PEOPLE
1 PRIVATE BRANCH EXCHANGE-IN	0	2 PRIVATE BRANCH EXCHANGE-RE	0
3 PRIVATE BRANCH EXCHANGE-EN	0	4 PRIVATE BRANCH EXCHANGE-SUP	0
5 PREMISES SERVICE CONSULTANT	0	6 INSTRUCTOR-PBX	0

ENTER SELECTION NUMBER: 0 EXIT

TECHPOWER CONFIDENTIAL AND PROPRIETARY

**Fig. 3j**

## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, #1-4

	TOTAL #AVAIL PEOPLE		TOTAL #AVAIL PEOPLE
1 COMPUTER-CLERICAL	0	2 COMPUTER-TECHNICIAN	0
3 COMPUTER-PROGRAMMER	0	4 COMPUTER SYSTEMS ANALYST	0

ENTER SELECTION NUMBER : 0 EXIT

TECHPOWER CONFIDENTIAL AND PROPRIETARY

## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, #1-4

	TOTAL #AVAIL PEOPLE		TOTAL #AVAIL PEOPLE
1 COMPUTER-CLERICAL	0	2 COMPUTER-TECHNICIAN	0
3 COMPUTER-PROGRAMMER	0	4 COMPUTER SYSTEMS ANALYST	0

ENTER SELECTION NUMBER : 0 EXIT

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**Fig. 3k**

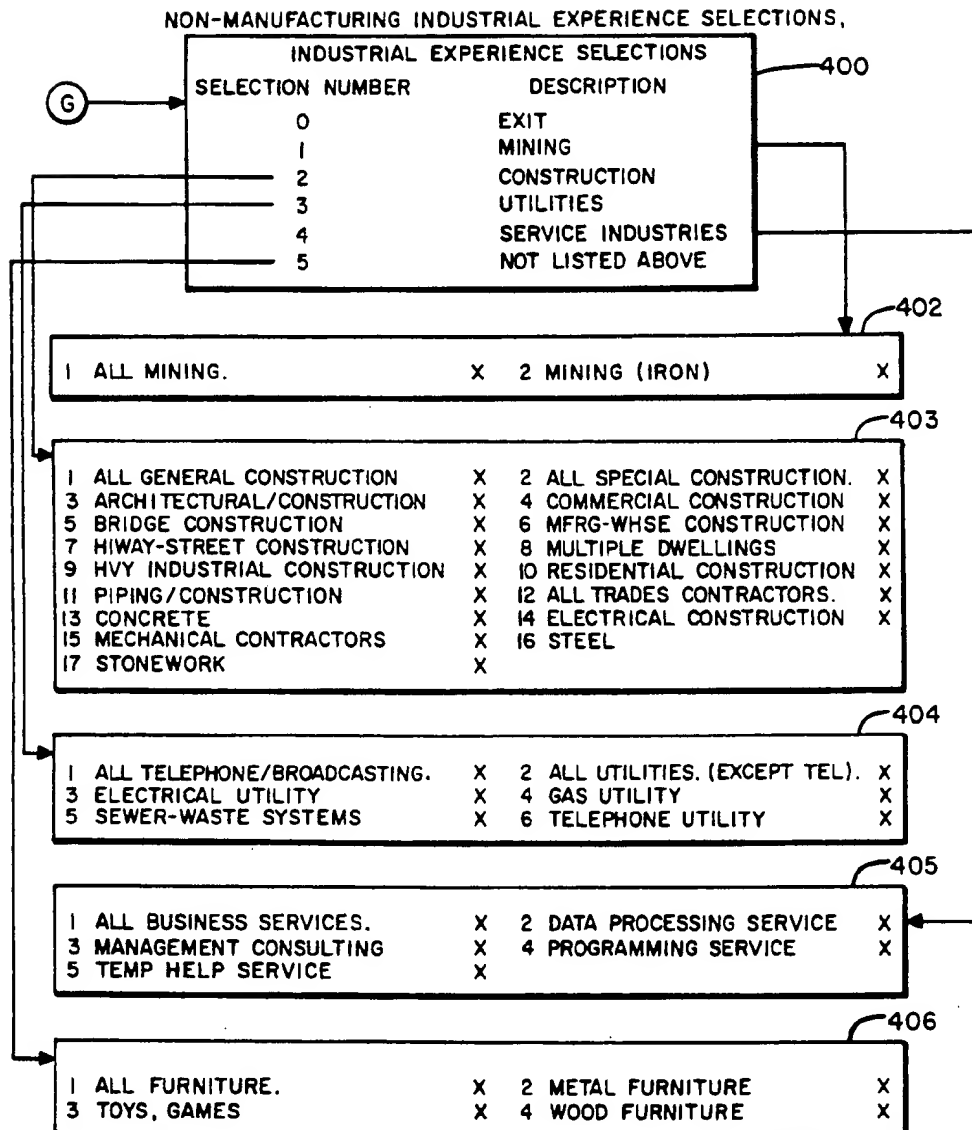
## TELEPHONE SPECIALISTS JOB DISCIPLINE SELECTIONS, #1-5

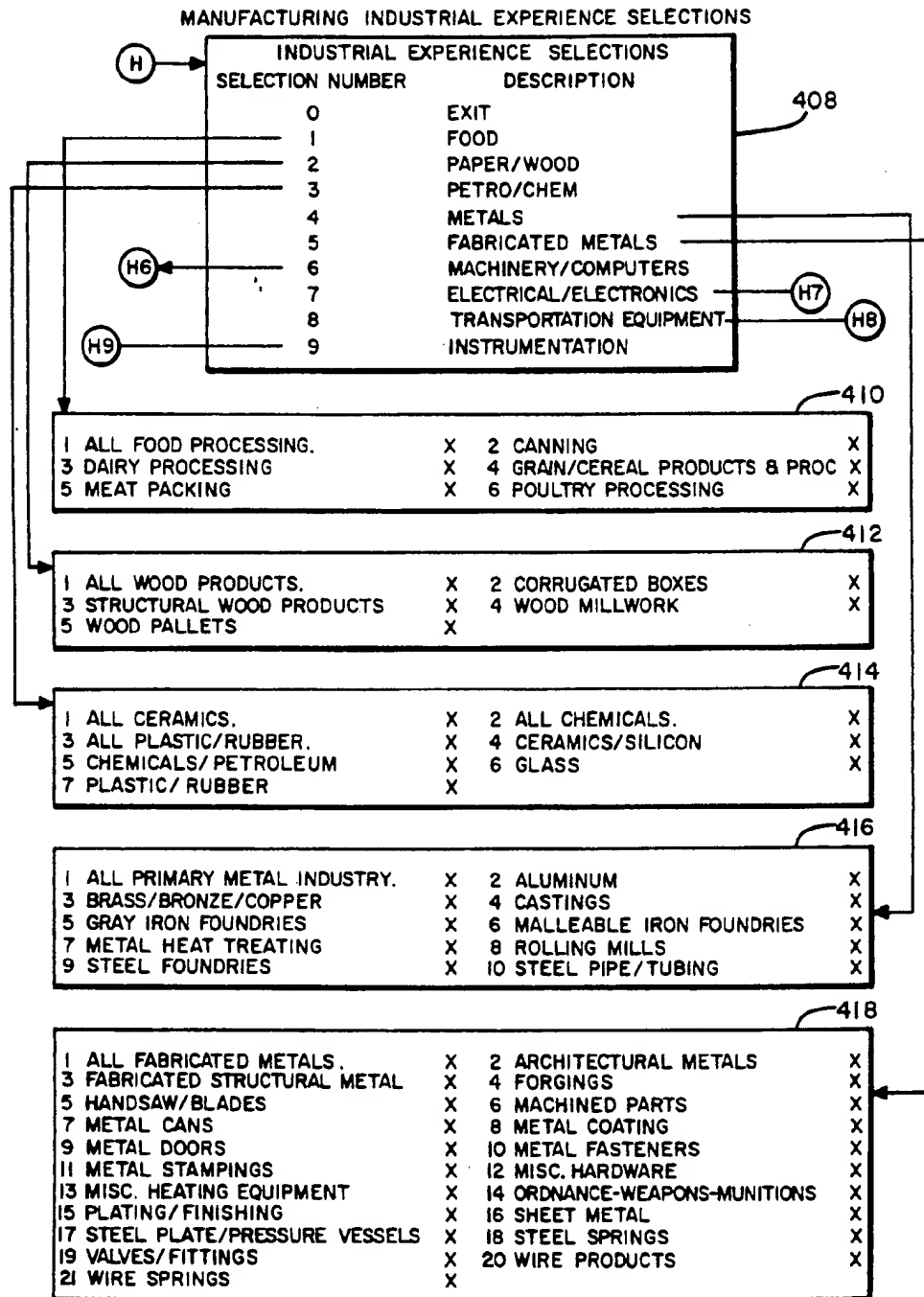
	TOTAL #AVAIL PEOPLE		TOTAL #AVAIL PEOPLE
1 INSTRUCTOR-NETWORK	0	2 INSTRUCTOR TRAINING DELIVERY	0
3 INSTRUCTOR TRAINING DEVELOPE	0	4 TECHNICAL WRITER	0
5 MARKETING	0		

ENTER SELECTION NUMBER : 0 EXIT

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**Fig. 3l**

Fig. 4a

Fig. 4b



**H9** 420

1 ALL INSTRUMENTATION.	X	2 AUTOMATIC TEST EQUIPMENT	X
3 AVIONICS/TEST SYSTEMS	X	4 COUNTING & FLOW METERS	X
5 DENTAL EQUIPMENT		6 ENVIRONMENTAL-HVAC CONTROLS	
7 INSTRUMENTATION		8 MEDICAL INSTRUMENTS	
9 OPTICAL INSTRUMENTS		11 ORTHOPEDIC/SURGICAL APPLIANC	
12 PHOTOGRAPHIC EQUIPMENT	X	13 WATCHES/CLOCKS	X

**H8** 422

1 ALL TRANSPORTATION EQUIP.	X	2 AIRCRAFT	X
3 AIRCRAFT PARTS	X	4 AUTOMOBILES	X
5 BUS/TRUCKS		6 MISC. VEHICLES	
7 MISSILE PROPULSION		8 MISSILES/SPACECRAFT	
9 RAILROAD EQUIPMENT		10 SHIPS	
11 TANKS/ARMORED/TRACKED VEHICL		12 TRUCK TRAILERS	X
13 VEHICLE PARTS/ACCESSORIES	X		

**H7** 424

1 ALL ELECTRICAL/ELECTRONICS.	X	2 BATTERIES	X
3 COMM/LIGHTING FIXTURES	X	4 COMMUNICATIONS/RF/RADAR	X
5 CONSUMER APPLIANCES		6 CONTROLS	
7 ELECTRICAL COMPONENTS		8 ELECTRICAL ENCLOSURES	
9 ENGINE ELECTRICAL EQUIPMENT		10 MAGNETIC ELECTRONICS/PCB-PWB	
11 MEDICAL ELECTRONICS		12 MOTOR/GENERATOR/TURBINES	
13 RESIDENTIAL LIGHTING FIXTURE		14 SEMI-CONDUCTORS/I.C.'S	
15 I.C. CIRCUIT HANDLERS/SWITCH		16 TELEPHONE EQUIPMENT	X
17 TRANSFORMERS/POWER SUPPLIES	X		

**H6** 426

1 ALL MACHINERY/COMPUTERS.	X	2 BLOWERS/FANS	X
3 BUSINESS MACHINES	X	4 COMM/LAUNDRY MACHINES	X
5 COMPRESSORS/NOZZELS/SPRAY	X	6 COMPUTERS/MICROPROCESSORS	275
7 CONSTRUCTION EQUIPMENT		8 CONVEYORS/MATERIAL HANDLING	X
9 DIES/MOLDS/FIXTURES		10 ELEVATORS	
11 FARM MACHINERY		12 FOOD MACHINERY	
13 LAWN MAINTENANCE/SNOW REMOVA		14 GEARS/DRIVES/REDUCERS	
15 HOIST, CRANES, MONORAILS		16 INDUSTRIAL COMM/L HVAC EQUIPM	
17 INDUSTRIAL PATTERNS		18 INDUSTRIAL PROCESS FURNACES	
19 INDUSTRIAL SERVICE MACHINES		20 INDUSTRIAL TRUCKS-STACKERS-L	
21 INTERNAL COMBUSTION ENGINES		22 METAL CUTTING TOOLS	
23 METAL FORMING TOOLS		24 MINING EQUIPMENT	
25 POWER TRANSMISSION ACCESSORI		26 PRINTING MACHINES	
27 PUMPS		28 ROLLER/BALL BEARINGS	
29 SCALES/BALANCES		30 SPECIAL MACHINES	
31 TEXTILE MACHINERY		32 TOOL MEASURING DEVICES	
33 TYPEWRITERS/WORD PROCESSORS	X	34 VENDING MACHINES	X
35 WEB-PAPER MACHINES	X	36 WELL SCREENS/DRILLING EQUIPM	X
37 WOODWORKING MACHINERY	O	XIT	
ENTER SELECTION NUMBER:			

Fig. 4c

**I** →

502

1 ALL CAD	X	2 ADAGE CAD	X
3 ALTOS (FRONTIER) CAD	X	4 APOLLO CAD	X
5 APPLICON CAD	X	6 AUTOCAD	X
7 AUTOTROL CAD		8 BELLCAD	
9 BRUNING CAD		10 CADKEY	
11 CADNETIX		12 CADVANCE	
13 CALAY CAD		14 CALCOMP/ISICAD	
15 CALMA ADVANCE CAD		16 CALMA DAL CAD	
17 CALMA DDM CAD		18 CALMA GDS I CAD	
19 CALMA GDS II CAD		20 CASE CAD	
21 CD2000/DDN ANVIL CAD		22 COMPUTOOL/CAMAX CAD	
23 CV CADDs I		24 CV CADDs II	
25 CV CADDs III		26 CV CADDs IV	
27 CV CADDs IV-X		28 CV CADDs 5-X	
29 CV MEDUSA CAD	X	30 CV/PERSONAL DESIGNER	X

**J** →

504

1 DAISY CAD	X	2 DATA CAD	X
3 DEC CAD	X	4 DESIGN AIDS CAD	X
5 DESIGNPRO CAD	X	6 EAS CAD	X
7 ECAD		8 EE DESIGNER CAD	
9 GEOMOD CAD		10 GERBER CAD	
11 HEWLETT-PACKARD CAD		12 IBM CADAM	
13 ICEM/DDN/CD2000		14 INFINITE GRAPHICS (IGI) CAD	
15 INTERGRAPH CAD		16 MCAUTO UGII CAD	
17 MCAUTO/UNIGRAPHICS CAD		18 MENTOR CAD	
19 MGM (MACINTOSH) CAD		20 MINICAD	
21 PCAD		22 POINTLINE CAD	
23 PRIME CAD		24 PROVISION CAD	
25 REDAC CAD		26 SCI-CARDS CAD	
27 TEKTRONIX CAD		28 TERA CAD	
29 TEXAS INSTRUMENTS CAD		30 VALID SCALD STAR IC CAE	X
31 VERSACAD	X		

Fig. 5a

K

506

1	AUTOCAD SYSTEM OWNER	X	2	AUTOCAD 2.0 OWNER	X
3	AUTOCAD 2.15 OWNER	X	4	AUTOCAD 2.17 OWNER	X
5	AUTOCAD 2.18 OWNER	X	6	AUTOCAD 2.5 OWNER	X
7	AUTOCAD 2.52 OWNER		8	AUTOCAD 2.6 OWNER	
9	AUTOCAD 2.62 OWNER		10	AUTOCAD TRAINING	
11	AUTOCAD 00-03 MONTHS		12	AUTOCAD 03-12 MONTHS	
13	AUTOCAD 1 YEAR		14	AUTOCAD EXPERT	
15	IBM AT(COMP) OWNER	X	16	IBM XT(COMP) OWNER	X

L

508

1	CAE	X	2	CAM	X
3	CIM	X	4	FINITE ELEMENT ANALYSIS	X

M

510

1	3M	EXPERIENCE	X	2	AMHOIST/AMCLYDE	EXPERIENCE	X
3	CDC	EXPERIENCE	X	4	DONALDSON'S	EXPERIENCE	X
5	ELLERBE	EXPERIENCE	X	6	FMC	EXPERIENCE	X
7	GENERAL MILLS	EXPERIENCE		8	GNB	EXPERIENCE	
9	HONEYWELL	EXPERIENCE		10	IBM	EXPERIENCE	
11	MEDTRONIC	EXPERIENCE		12	NSP	EXPERIENCE	
13	NW BELL/AT&T	EXPERIENCE		14	ONAN	EXPERIENCE	
15	PILLSBURY	EXPERIENCE		16	ROSEMOUNT	EXPERIENCE	
17	TECHPOWER	EXPERIENCE		18	THERMO KING	EXPERIENCE	
19	TORO	EXPERIENCE		20	UNISYS	EXPERIENCE	
21	3M RETIREE			22	CDC RETIREE		
23	HONEYWELL RETIREE			24	NW BELL/AT&T RETIREE		X
25	SPERRY RETIREE	X					

Fig. 5b

P

512

1	4-BIT	X	2	ANAYK	X
3	ANUYK	X	4	CDC COMPUTERS	X
5	DEC COMPUTERS	X	6	HEWLETT-PACKARD COMPUTERS	X
7	IBM COMPUTERS		8	IBM PC-XT-AT	
9	INTEL CHIPS		10	INTEL 8080	
11	INTEL 8085		12	INTEL 8086	X
13	INTEL 8088	X	14	MACINTOSH COMPUTER	13
15	MOTOROLA	23	16	MOTOROLA 6800	X
17	MOTOROLA 68000	X	18	SPERRY-UNIVAC COMPUTERS	X

O

514

1	ADA	X	2	C LANGUAGE	X
3	COMPUTER GRAPHICS	X	4	FORTRAN	X
5	LISP	X	6	PASCAL	X
7	REAL-TIME	X	8	SIMULATION-MODELING	X
9	TACTICS-MISSION	X	10	UNIX	X

Q

516

1	ARTIFICIAL INTELLIGENCE	X	2	AUTOMATED ASSEMBLY	X
3	BIPOLAR	X	4	CALIBRATE	X
5	CLEAN ROOM	X	6	CPM	X
7	GEOMETRIC TOLERANCING		8	HEAT TRANSFER	
9	HYDRAULICS		10	INFRA RED	
11	JIT		12	LASER	
13	MIL STDS		14	NC/CNC	
15	NUCLEAR		16	OPTICS	
17	PERT		18	PLC'S	
19	PROFESSIONAL ENGINEER		20	ROBOTICS	
21	RUBYLITH		22	SURFACE MOUNT	
23	THICK FILM		24	THIN FILM	
25	VSLI	X	26	WIRE WRAP	X

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Fig. 5c

TECHPOWER JOB DATABASE STATUS 05/14/89 TECHPOWER COPYRIGHT 1989 PAGE 1

JOB CLASSIFICATION TITLE	NUMBER OF CANDS	BILLING RATE		
		AVG	HIGH	LOW
ARCHITECTURAL: ALL LEVELS	25	17.72	24.00	9.00
CAD EXPERIENCE	117	23.91	52.50	12.00
ELECTRO-MECHANICAL DESIGN-DRAFTERS	15	21.00	30.00	12.75
ELECTRICAL POWER: ALL LEVELS	9	26.75	52.50	15.00
ELECTRONIC-PC DRAFTERS & DESIGNERS	20	21.30	37.50	12.75
ELECTRONIC ENGINEERS & DESIGNERS	90	35.64	75.00	10.50
HVAC DESIGN: DRAFTERS & ENGINEERS	10	20.70	31.50	12.75
MECHANICAL DESIGNERS & DRAFTERS	58	28.36	52.50	16.50
MECHANICAL ENGINEERS	42	34.04	75.00	10.50
MANUFACTURING-PRODUCTION-IE-ENGINEERS	78	25.31	51.00	15.00
PLANT LAYOUT-FACILITY PLANNING	15	20.35	37.50	9.00
PROGRAMMERS/PROGRAMMER-ANALYSTS	177	33.67	70.50	9.00
STRUCTURAL-CIVIL: ALL LEVELS	62	23.82	60.00	12.00
TECHNICIANS	152	17.10	37.50	9.00
TOOLING: ALL LEVELS	1	22.50	22.50	22.50
ALL DISCIPLINES & LEVELS	720	25.62	90.00	9.00

EVERY 18 MINUTES OUR AVAILABILITY LIST CHANGES !

**Fig. 7**

## --- SEARCHPOWER ---

PRESENTED TO:

SMITH JOE  
ABC CO.  
C965091

FOR YOUR OPENING:

ELECT. ENG.

YOUR REQ. NO. 22222

## EDUCATION CODE:

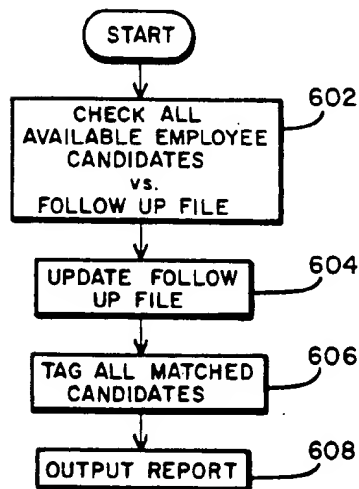
- |                         |                   |
|-------------------------|-------------------|
| 1. ON THE JOB TRAINING  | 5. B.S. DEGREE    |
| 2. TECH SCHOOL TRAINING | 6. POST GRAD WORK |
| 3. TECH SCHOOL GRADUATE | 7. M.S. DEGREE    |
| 4. COLLEGE TRAINING     | 8. PH. D.         |

## MATCH CRITERIA:

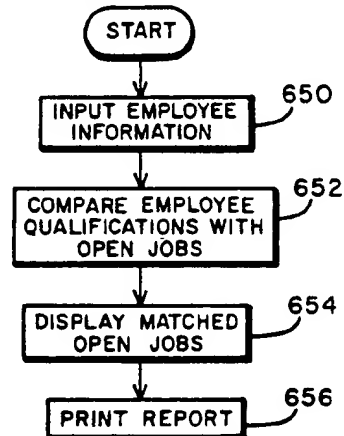
- |                                     |
|-------------------------------------|
| 1. ELECTRONIC DIGITAL ENGINEER-(71) |
| 7. MOTOROLA-(23)                    |
| 4. COMPUTERS/MICROPROCESSORS-(275)  |
| 10. ABC CO. EXPERIENCE-(68)         |

FILE #	NAME	EXP	EDUC	RATE	1	4	7	10	COMMENTS
10780	NAME 1	14	7	33.00	*	*	*		
15975	NAME 2	30	5	25.50	*	*	*	*	
21237	NAME 3	8	6	45.00	*	*	*		
20505	NAME 4	10	5	52.50	*	*	*		
21037	NAME 5	22	6	45.00	*	*	*		
02738	NAME 6	17	6	25.50	*	*	*		

EVERY-----MINUTES OUR AVAILABILITY LIST CHANGES!

Fig. 6Fig. 8

## REVERSE MATCH

Fig. 9

## AUTOMATED METHOD FOR SELECTING PERSONNEL MATCHED TO JOB CRITERIA

### BACKGROUND OF THE INVENTION

#### I. Field of the Invention

The invention is directed to an automated method of selecting personnel matched to particular job requirements, and, more particularly, to a method of selecting qualified job candidates for positions defined by specific selection criteria based upon encoded job classification titles, industrial experience and special qualifications.

#### II. Discussion of the Prior Art

For many years, employment agencies (sometimes called search firms) have been attempting to match job candidates to specific job criteria as required by employers. Most employment agencies receive payment only for those positions which they fill with qualified employee candidates. Therefore, in a highly competitive environment, speed in identifying and presenting candidates and presenting to potential employers is very important. It is also extremely important to be able to handle a large number of potential candidates in various fields in order to be in the best position to fill employers' job requirements as they open.

The most commonly known method of matching personnel to job specification criteria requires a person trained in job placement skills to manually review documents such as resumes and other qualifications related documents while comparing such documents to criteria specified by the potential employer. Such a manual system has several drawbacks. It is obviously very slow in most cases since there is no fast way to sort unqualified candidates from qualified candidates on a large-scale basis. Further, it is believed that an agency using such a system can effectively handle only up to 60 active personnel files per search consultant. This is because much of the information about the candidates must be remembered by the search consultants themselves. Use of such a system makes it difficult to identify and present a list of qualified candidates together with resumes and other needed information to the requestor in less than a matter of several hours.

Some automated systems for selecting personnel based on job criteria do exist. It is believed that such systems are almost exclusively based upon the use of key word searching. That is, qualifications of various personnel are stored in a computer database as, for example, in the form of resumes. The searcher then types in certain key words which relate to the job qualification criteria hoping to match the key words with the job criteria. Such systems are limited by the fact that the use of key words is very imprecise. This is due to the fact that job titles and, in particular, technological slang terms or "buzz" words have meanings which vary quite extensively from employer to employer and from one region to another. Further, such systems are not "user friendly" because they require significant training and experience with the system before it can be used effectively. Such systems are further limited by misspellings which can commonly occur in large databases and which may cause candidates to be missed by a key word approach. Such systems also require a complete line-by-line search of every file in the system to avoid missing potential candidates.

### SUMMARY OF THE INVENTION

The present invention offers advantages and improvements over the prior art because it provides a fast, automated, logically organized, user friendly method for matching the qualifications of job candidates to particular job related criteria as supplied by potential employers. The method of the invention includes the step of selecting a first set of employee records having qualifications matching at least one of the predetermined set of first job criteria from a first data file wherein the first data file includes a first plurality of employee records and each record includes a first job selection criteria code and a corresponding employee code. A second step may be included to select a second set of employee records having qualifications matching at least one of a predetermined set of second job criteria from a second data file which includes a second plurality of employee records wherein each record includes a second job selection criteria code and a corresponding employee code. In the preferred embodiment, a third selection is made from yet a third data file including employee records having a third job selection criteria code and a corresponding employee code. This results in three groups of selected employee records. The method of the invention then requires selecting the records of those employees whose employee codes occur at least once in each of the matched sets.

In the preferred embodiment of the invention, the first database includes job title records wherein each record includes a job title code based upon the Dictionary of Occupational Titles as published by the United States Department of Labor. The second data file is preferably comprised of an industry code based upon the Standard Industrial Classification Manual (herein called SIC codes) as published by the United States Office of Management and Budget and a third data file preferably comprises arbitrary special codes which are related to technical or other parameters such as specific types of machines or computer model numbers. In the preferred embodiment, it is possible to match criteria from all three data files or from any two data files. It is also possible to match job criteria against records held in any one of the data files. The preferred embodiment of the method of the invention is an "English in English out" system wherein lookup tables in the form of dictionaries are provided to translate English words into code and translate code back into English words for eventual display or printout to the user.

In one embodiment of the invention, there is provided a means for printing out all relevant information relating to selected job candidates including resumes, experience, education, criteria matched and other information.

Another feature of the invention provides for identification of matched employees against a company code.

One embodiment of the method of the invention further includes a means for printing out a summary report of all candidates stored in the system according to job title and/or special classifications, number of candidates available and billing rates.

The preferred embodiment of the system offers the capability of inputting more than one qualification criteria to be selected from each database file.

In one embodiment of the invention there is further included a means for restricting certain data for access only by a user employing a security password.

Other objects, features and advantages of the invention will be apparent to those skilled in the art from the description of the preferred embodiment, claims and drawings herein wherein like numerals refer to like elements.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1a shows a block diagram of a system embodying the method of the invention.

FIG. 1b shows a high level flow chart of the method of the invention.

FIG. 1c shows an example of apparatus used for implementing the method of the invention.

FIG. 1d is a more detailed illustration of system output options.

FIG. 2a shows an introductory screen.

FIG. 2b shows a block diagram of a sample main selection screen and the major selection category branches employed by one example of an embodiment of the invention.

FIG. 2c shows one example of a computer screen main menu configuration after a number of selections have been made by the user.

FIGS. 3a-3i show computer screen menu configurations for the job discipline categories available for selection in one embodiment of the method of the invention.

FIGS. 4a-4c show computer screen menu configurations for the industrial experience categories available for selection in one embodiment of the method of the invention.

FIGS. 5a-5c show computer screen menu configurations for the special categories available for selection in one embodiment of the invention.

FIGS. 6 and 7 show examples of screen configuration of reports generated by one embodiment of the method of the invention.

FIG. 8 is a flow chart of a follow-up computer routine which may be implemented using the method of the invention.

FIG. 9 is a flow chart of a reverse search routine which may be implemented using the method of the invention.

Note that throughout the drawings, the various circled letters show the path which the program will follow upon selecting any of the given selection numbers.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1a, a block diagram of a system embodying the method of the invention is shown. For purposes of explaining the invention, the invention will be described as it is embodied in a particular embodiment used for placement of technical personnel. It will be readily understood by those skilled in the art that the invention is not so limited, but may be used to match job criteria in other fields to job candidates having varied qualifications in those other fields. However, it is considered most helpful for understanding of the invention to describe the invention as it relates to a specific example.

As shown in FIG. 1a, the method of the invention generally includes organizing job related criteria into first, second and third data files 10, 20 and 30 respectively. From the first, second and third data files, first, second and third temporary files are created based upon selection criteria supplied by the user. These are shown as temporary job codes 12, temporary SIC codes 22 and temporary special codes 32. In the preferred embodi-

ment, a lookup table in the form of a dictionary 40 is provided to convert codes from numerical data to English language words. Matches with the job criteria are accomplished at block 100 through correlating employee numbers which are common to the first, second and third temporary files. Once the employee numbers have been identified, information from a client file 50, personnel file 60, and resume file 70 may be incorporated at step 100. A computer may then be used to output reports 80, resumes 90 and database status reports 94.

Other files utilized and maintained by the system are a confidential card file 61, open job requirements file 101 and follow-up file 103. The features and uses of these files are explained in detail below.

A utility computer program 33 is included in the preferred embodiment of the invention. Program 33 is preferably run on a daily basis. Its function is to total the number of employees available in each job criteria category and to store the results in the dictionary files. This is explained in more detail below.

In the preferred embodiment of the invention, the database files and file matching computer software are implemented to run on a NEC multispeed HD lap top computer using an MS DOS (TM) operating system. One embodiment of the method of the invention has been implemented using FoxBASE+ Revision 2.00 database software which is commercially available from Fox Software, Inc., Perrysburg, Ohio 43551. The software embodying the method of the invention is translatable to other equivalent computers such as personal computers and main frame or mini computers. It is also possible to run the automated selection process of the invention from a remote location via modem. Other programming languages such as C language may also be used to implement the method of the invention.

Referring now to FIG. 1b, a high level flow chart of the method of the invention is shown. FIG. 1c shows a block diagram of typical apparatus which is used to implement the program. Such apparatus preferably includes a keyboard 130, a computer 132 having means for storing information 138, and a printer 134 which outputs reports 136. Also included is a means for display 140 which may be any compatible commercially available CRT tube or flat panel display. As indicated above, all of these components are available commercially and typically the keyboard, computer, disk storage, memory and display are integrated into a single lap top unit such as an NEC HD model computer. In the preferred embodiment of the invention, employee files, dictionary files and the other data files are stored on disk storage. Random Access Memory (RAM) storage is used to hold and execute the program under control of the computer processing unit.

Referring now continuously to FIGS. 1b and 1c, the general operation of the method of the invention will be explained. In general, the user would initiate use of the method of the invention by inputting the first three letters of his company's name from the keyboard in response to a prompt from the computer as shown on display 140. The program then checks the dictionary 40 at step 103 to locate a match for the company in the dictionary database. If no match is found for the company name, the program skips to step 107. If a match for the company name is found, the program would then try to locate a match of the company name to employee employee candidates at step 104. If matched employee candidates are found in the special code database 30, the



records of these matched employee candidates would be stored at step 106 in a temporary "experience" file (not shown). At step 107 the user is prompted to supply background information including information such as the job description, number of openings, telephone number, contact name and other information which may be reproduced on the cover sheet of any reports generated by the system in order to identify the search.

The user would then go on at steps 108, 112 and 116 to select job title criteria, industry experience criteria and special criteria, respectively. These selections would then be stored at steps 110, 114 and 118 as shown in FIG. 1b. The selected records are stored in temporary files 12, 22 and 32 as shown in FIG. 1a. At step 120, the program then matches selections from the job title temporary file 12, the temporary SIC code file 22 and the temporary special code file 32. A match is determined to exist for each employee whose employee code is contained in each one of the three temporary code files. This matching is done through a logical command in the FoxBASE (TM) programming language. The match command follows the format below shown in pseudo-code:

(JOB1 .or. JOB2 .or. JOB3) .AND. (SIC1 .or. SIC2 .or. SIC3) .AND. (SP1 .or. SP2 .or. SP3) = MATCH.

Where:

JOB1-JOB3 represent the employee code selection from the job title code file;

SIC1-SIC3 represent the employee code selections from the SIC code file; and

SP1-SP3 represent the employee code selections from the special code file.

Once the matched employees are selected at step 120, the preferred embodiment of the program goes on to further identify those employees from the matched set whose employee code also appear in the temporary experience file. At step 124, the matched set is merged with the background information data from the client file 50 and data from the personnel file 60 into an output. FIG. 1d details the types of outputs optionally available using the system of the invention. The system includes means for producing the report on screen 124A, means for printing a search report 124B, means for viewing resumes 124C and/or printing resumes 124E by accessing the resume file 70, and means for viewing the confidential card files 124D. Those skilled in the art will appreciate that any information which is visually displayed on a computer display device may easily be provided as hard copy using a printer. This description is intended to give an overview of the method of the invention. A more detailed explanation follows below.

#### IV. Job Title Code Data

In the example embodiment of the method of the invention, the job title code data file 10 includes job title codes and corresponding employee code numbers. The employee code numbers are, for example, five digit logical numerical count numbers which are unique to each individual or potential employee for whom data is stored in the system database. There may be several job title codes stored in the job title code data file for each employee code depending on the job experience of the particular employee. The job title codes may be a width of about 9 characters and are preferably based upon the pre-assigned codes as cataloged in the Dictionary of Occupational Titles as published by the United States Department of Labor Employment and Training Administration. While it is possible to create job title codes based upon an independent, logical numbering system,

it is preferable in the United States to use the pre-existing codes in the Dictionary of Occupational Titles. Modifications to these codes may be made as deemed appropriate by the user of the automated method of the invention.

The codes found in the Dictionary of Occupational Titles allow for a structured and logical search since the codes are organized from left to right to identify very broad occupational titles with the left most digits. More specific job descriptions are identified with the right most digits. This enables searching of very broad categories based upon a right hand side truncated job title code, or a more particular job title based upon a full 9 digit occupational title code. An example of some of the occupational title codes or job title codes as used by one example of the method of the invention is shown in the Appendix hereto.

Use of these codes to select personnel which match desired job criteria is also explained further in detail below. The commercial software used in implementing one embodiment of the invention also supplies a sequential record number which identifies each record in the file. A partial list of a job title code file as used in one embodiment of the invention is shown in Table 1 below.

TABLE 1

FN010	Code
09079	001061010
02261	001061010
21025	001061010
17730	001061010
14799	001161010
21399	001161010
21823	001161010
22000	001161010
17384	001261010
20347	001261010

In one embodiment of the invention, Table 1 includes about 1720 data records of the type shown above in Table 1.

#### V. SIC Codes

The second data file used in the example embodiment of the method of the invention includes a plurality of records each having an SIC code and a corresponding employee number. As is the case with the job title codes, one employee number may correspond to more than one SIC code depending upon the experience of the particular employee. Also, as in the case of the job title codes, the records are sequentially numbered by the commercial software. The SIC code is based upon the codes in the Standard Industrial Classification Manual as published by the United States Executive Office of the President, Office of Management and Budget. As in the case of the Dictionary of Occupational Titles, the SIC codes are organized logically with the left hand most digits referring to broad industrial classes and the right hand most digits referring progressively to more narrow industrial classifications. In this way, the system employing the method of the invention may search industry classifications broadly or narrowly as explained further in detail below. SIC codes may be modified as desired to customize the searching process. An example of some of the SIC codes and corresponding industry classifications are shown in the Appendix hereto.

In one embodiment of the invention, the SIC code data file contained about 2756 files. In the preferred

embodiment, the employee code may have a width of about 5 characters while the SIC code may have a width of about 4 to 8 characters. One example of some records contained in the example embodiment of the method of the invention are shown below in Table 2.

TABLE 2

FN010	Code
18258	1011
10379	1521
14799	1521
19067	1521
09079	1521
02621	1521
21002	1521
10978	1521
17730	1521
21322	1521

#### VI. Special Codes

In the example embodiment, a special code data file is used as a third selection criteria. As in the case of a job title code file and the SIC code file, the special code file includes a plurality of records having sequential record numbers as assigned by the commercial program used, special codes as assigned by the user of the system and employee codes corresponding to each special code record. The employee codes are as explained above and, as in the other files, there may be more than one special code corresponding to a single employee. The assignment of the special codes is left to the ingenuity of the programmer. A sampling of special codes used in the example embodiment of the invention is shown below in the Appendix hereto. The special codes can be used to "customize" a search by providing criteria referring to a specific company or a specific model number machine or computer, for example. Special codes used in this example are two alphanumeric characters in width although the data file in this example allows for a width of 4 characters if needed. Some sample records contained in the example embodiment of the invention are shown below in Table 3.

TABLE 3

FN010	Code
03766	01
21723	01
02921	02
19067	02
06888	03
18443	04
04920	04
03713	05
04908	05
07239	05

The use of the special code file for matching personnel to particular job criteria is explained further in detail below.

#### VII. Temporary Databases

The job title code data file 10, SIC code data file 20, and special code data file 30 contained coded data from available personnel candidates. The method of the invention allows a use to select several skills and qualifications a successful candidate must possess to fill a job requisition. Those with that skill will be extracted from the above databases and stored in the temporary databases 12, 22, and 32, which will contain Only selected personnel. These temporary databases are smaller and more manageable than the above databases, thus producing a more efficient match for the user. (The actual selection process employed by the method of the inven-

tion is explained further in detail below in the section labeled Operation of the Invention.) It follows, therefore, that the temporary job title code data file 12 is a subset of the larger job title code file 10. Similarly, the temporary SIC code data file 22 is a subset of the SIC code data file 20, and the temporary special code data file 32 is a subset of the special code data file 30. The length of the temporary files varies and is a function of the breadth of the search being conducted, the number of matches found and other factors.

#### VIII. Dictionary

The dictionary 40 employed by the example embodiment of the invention provides a lookup table for converting the job title codes, SIC codes and special codes from code numbers to English words. In the preferred embodiment of the invention, the dictionary is divided into three database files, each corresponding to one of the code types. In the example embodiment of the invention, the dictionary is divided into a first file for job title codes, a second file for SIC codes and a third file for special codes. The use of the numerical codes is transparent to the user who is only required to use English words in utilizing the system.

Each of the three dictionary files is organized into several fields. The dictionary file which provides the English to job code conversion for the job title codes file comprises six fields in the example embodiment. One example of a dictionary job code file is shown in Appendix Table VIII-1. As can be seen from reference to Appendix Table VIII-1, the fields comprise a record number field, a description field (DESCRIPT) having a width of about 35, a CODE field having a width of 9 characters corresponding to the 9 character job title codes, a 1 field wide sorting field labeled "I", a 5 column wide availability count field, CNT1, and a menu sorting field MKY having a width of about 8 characters. The record numbers are assigned by the FoxBASE program. The descriptions in the DESCRIPT field are descriptions as typically found in the Dictionary of Occupational Titles. Similarly, the codes are as found in the Dictionary of Occupational Titles corresponding to the English description. The "I" field is used by utility programs other than the searching program which comprises a method of the invention. For example, the "E" in the "I" field represents ENGINEER, "P" may represent PROGRAMMER, "D" may represent DRAFTSMAN, "T" may represent TECHNICIAN, and other codes may be used as desired by the user. The CNT1 field contains the availability count as stored there through the operation of computer program 33, TOTAL AVAILABILITY, which is the utility program used for totalling all personnel available in the system against SIC codes, job title codes and special codes. The MKY field is a nine digit field used to conveniently group types of job titles so that the program can quickly display menus as selections are made during operation of the program.

Further in explanation of the MKY field by example, the MKY code 1010001 is used by the program incorporating the invention to organize and display menu number 212 as shown in FIG. 3b in the following manner. The left hand most digit being a "1" corresponds to the number "1" selection from menu 202 in the general job discipline of ENGINEER. The third left hand most digit, in this case being a "1", corresponds to the selection ARCHITECTURAL/FACILITIES on menu 208. In this example, the program will bring up onto the

menu all of the job titles out of the dictionary which have MKY codes with the first three left hand digits matching "101". The right hand most digits are used by the program to order and provide selection numbers for the English job titles which appear on the menu, as for example in menu 212. A further example of how this MKY field is used can be seen with reference to menu 214 which is sorted on the first three digits "102" for the AEROSPACE job discipline.

In the preferred embodiment of the invention, a second dictionary file corresponding to the SIC codes is used in a manner similar to the job title dictionary described above. A listing of the SIC code dictionary as used in one example embodiment of the invention is shown in Appendix Table VIII-2. As can be seen with reference to Appendix Table VIII-2, the SIC dictionary also comprises a record field, a description field, a code field, a CNT1 field, and an MKY field. The record number is assigned by the FoxBASE system. The descriptions are descriptions corresponding to the SIC manual. The codes correspond to SIC codes as found in the SIC manual. Other codes and descriptions may be included in this field as a matter of design choice. The CNT1 or count field represents the number of available employees for each of the SIC codes. As with the job title dictionary, the number available is determined by the utility program 33. The MKY code is used as above to generate menu displays.

The third dictionary used in the preferred embodiment of the invention is a dictionary comprised of special codes. These codes may be generated by the user for the purpose of describing areas of expertise which are particularly useful in the job field being services. As with the above two dictionaries, the special dictionary includes a record number, description, code number, availability count CNT1, and an MKY field. Reference to Appendix Table VIII-3 shows the contents used in the example embodiment of the invention. The special dictionary has field widths identical to the SIC code dictionary.

#### IX. Client File

The client file 50 may optionally be included in the system and may contain information pertaining to the employment agency's clients, that is, employers who are searching for candidates to fit into particular job openings. The client file may contain information such as the name of a client, the client's address, the name of the client contact, telephone numbers, client preferences (for example for former employees or retirees), and other relevant information. This information is used in putting the proper headings on reports and may be used for searching preferential candidates as explained more in detail below.

One embodiment of the invention has incorporated the client name with a corresponding special code in the special code dictionary and does not include a separate client file.

#### X. Personnel File

The personnel file 60 includes information on all candidates in the system including name, phone numbers, address information, billing rates, and other pertinent information. As in the case of the client file 50, the personnel file 60 supplies information useful in printing reports. The personnel file further includes the employee code numbers so that the selected employee code numbers may be matched to the named individuals having a password file. The personnel file may also preferably include a transfer code which is used to

periodically update the system files. On a periodic basis, those employees who have become unavailable for employment may be tagged by the transfer code for transfer from the on-line, active files to a larger, permanent storage file which is preferably off line. This transferring includes the transfer of all records related to the unavailable employee code. The transfer operation is carried out by a utility program wherein a user changes the transfer code for each employee in the personnel file as required. The actual transfer of records is implemented as a batch mode operation which sorts on the transfer code. It is also advantageous to store the employees "next available date" in the personnel file. This date can be periodically checked in order to generate reminder notices sufficiently in advance of the availability date to allow for preparation and updating of files to be returned to the active or available status from the permanent file.

While it is one object of the invention to provide a method which may be used by customers as well as employment agency or search firm personnel, the owner of the database and software employing the method of the invention may desire to keep certain information confidential and deny access to that information except to authorized personnel. In the example embodiment of the invention, a password file called CARD FILE 61 is included which may be accessed only through the use of a restricted security code. The password file may include information such as unlisted phone numbers, wage demands, last contact date, messages and other confidential information about specific employees. These files also use the employee code for identification purposes and are part of the Personnel File 60. The last contact date is advantageously tracked by the system to flag employee candidates who have not been contacted within a predetermined time period. The system flags these candidates for follow-up calls. Candidates whose last contact date is earlier than a predetermined cutoff date are transferred to the permanent file.

#### OPERATION OF THE INVENTION

Having described in detail the various features embodying the invention, attention will now be directed to operation of the method of the invention as used in a typical environment.

Referring to FIG. 2a, the first screen of the example program is shown. The user responds to the instructions shown by entering the first three letters of the user's company. The program uses this code to check the special code dictionary as shown in Appendix Table VIII-3 for availability of employees having experience with that company. In normal use, only larger companies or companies which are frequent clients of the agency using the system on the invention will be listed in the special code dictionary. Examples of such companies can be seen in Appendix Table VIII-3 listed under MKY code 2500001 to 25000027. If there is a match to the company code in the special dictionary, the program proceeds to store in a temporary file (not shown) all of the employee codes which match the company code out of the special code file 30. This temporary file is kept active until the matching between the 3 temporary files 12, 22 and 32 is completed. After the matches have been found from files 12, 22 and 32, the temporary file containing the employees with company experience is scanned by the program to identify those employees who have been found as matches from the three tempo-

rary databases so that they can be identified as having prior company experience on the file report.

Referring now to FIG. 2b, four of the higher level menus employed by the method of the invention are shown. These are the main menu 200, job title menu 202, industrial experience selections 204, and special qualification selections menu 206. Generally, when using the selection system of the invention, the user progresses through a series of such menus selecting the categories which he or she desires to see put up on the computer screen by entering the numerical selection code specified on the menu from a computer keyboard. For example, if the screen is displaying the main category menu 200 and the user wishes to view the information in the job title files the user would enter the number "1" from the keyboard. Selection number "1" from the main categories menu will cause the software program to pull up and display menu 202. In a like manner, selection number "2" from the main menu 200 will pull up menu 204, industrial experience selections, and selection number "3" from the main menu 200 will pull up menu 206, special qualification selections.

As can be seen in FIG. 2b, the main menu includes boxes entitled JOB CLASS SELECTIONS 201a, INDUSTRY SELECTIONS 201b, AND SPECIAL SELECTIONS 201c. These boxes are filled in by the program as the user makes his selections within those three categories. In the example embodiment of the method of the invention, three selections are allowed within each category. These selections may all be made upon entering any one of the three categories or may be selected by multiple entries to the categories from the main category menu 200. Although the example herein limits the number of selections within any category to 3, this number may be expanded or limited depending upon the particular application through programming means well known in the art. It should be pointed out further that the method of the invention does not require that the categories be entered in any particular order. It is also possible to make a selection of personnel through entering any one, two or three of the main category selections. It is not necessary to enter a selection from each category in order for the program to match the personnel to the job requirements.

To continue with an example of the operation of the invention, assume that a user selects "1" JOB TITLES as the first selection from the main menu. The program will then display menu 202 having a list of job titles each having a selection number. In the example embodiment of the invention, the job title menu 202 is programmed into the software as a fixed format display. Assuming that the user then selects selection number "1" from menu 202, which is described as ENGINEER, the system will proceed to the engineering job discipline selections as shown in FIG. 3a. Following this same example and now referring to FIG. 3a, menu 208, which is also a fixed format menu, will be displayed on the screen. The user would then select a field of engineering which is desirable depending upon the job criteria the user desires to match. If, for example, the user was interested in electronic engineers, he would input selection number "5" from the keyboard. Referring now to FIG. 3b, after selection number "5" from menu 208, the system would display menu number 218 which is created through the selection of all job titles encoded under electronic engineers as defined in the Dictionary Lookup Table file for job titles. That is, all job titles under MKY codes 1050001-1050018 will be listed in

menu 218 together with the number of employees available in each category and a selection number from "1" to "18".

Menu number 218 is divided into subcategories of degreed and nondegreed electronics engineers. After each category there is a number sometimes represented herein by the letter "X" which represents the total number of personnel currently available in the job title code file 10 having the job title indicated. The numbers on the left hand side of the job title shown in 218 are selection numbers. At this point, the user would select the job title most closely matching the job criteria to be matched. As discussed above, the program allows for multiple entries. Assuming that the user wants digital engineers, he would select number "5" from menu 218, ELECTRONIC DIGITAL ENGINEER.

As can be appreciated by those skilled in the art, the user could in this way match various job title criteria through this selection process. The example embodiment of the program includes subcategory menus for each of the nine selections shown in menu 208. These are shown in FIGS. 3a, 3b and 3c. Directing attention to menu number 208, selection number 1 would pull up menu 212 for degreed and nondegreed ARCHITECTURAL/FACILITIES ENGINEERS, selection number 2 would pull up menu number 214 for AEROSPACE ENGINEERS. Similarly, selection numbers "3", "4", "5", "6", "7", and "8" would respectively bring up menus 216, 217, 218, 220, 222 and a listing of personnel in categories otherwise not listed.

Referring again to FIG. 2c, the title ELECTRONIC DIGIT—(71) will now appear in the job class selections box 201a. The user will then proceed to select the next main category. Assuming the user follows the sequence enumerated in menu 200 as shown in FIG. 2b, he would choose selection number "2" INDUSTRIAL EXPERIENCE. Upon entering this selection, the program will display menu number 204. The user will then select manufacturing or non manufacturing selections "1" or "2", respectively. As in all of the menus used in this system, if the user has entered a menu which is not useful to him, he can input selection number "0" which would result in an exit from that menu to the previous menu selected. Assuming that the user selects "2" MANUFACTURING, the program will display menu 408 as shown in FIG. 4b listing the selection numbers "1"—"9" for broad categories of manufacturing industrial experience. In this example, assume that the user selects selection number "6" MACHINERY/COMPUTERS. Upon entering selection "6" the program will display menu 426 as shown in FIG. 4c. If the user is looking for an employee experienced in computers and microprocessors, he will then select selection number "6" showing an availability of 275 employees in this category.

The selections possible under industrial experience are shown in FIGS. 4a-4c and include menu number 400 wherein selection of menus 402, 403, 404, 405 and 406 are possible through inputting selection numbers "1"—"5". Under the manufacturing industrial experience selection menu 408, the user could choose from menus 410 for FOOD, menu 412 for PAPER/WOOD, menu 414 for PETRO/CHEM, menu 416 for METALS, menu 418 for FABRICATED METALS, menu 426 for MACHINERY/COMPUTERS, menu 424 for ELECTRICAL/ELECTRONICS, menu 422 for TRANSPORTATION EQUIPMENT, and menu 420 for INSTRUMENTATION. As in the case of job titles,

the user may select more than one industry as criteria to be matched.

Referring again to FIG. 2b and continuing with the example of operation of the program, reference is again made to menu 200. At this point selections have been made from the job title category and the industrial experience category. Note that a match between those two main category selections could be performed at this time. It is not necessary to pick a special selections category. However, in most cases, it is useful to make such a selection if the user or potential employer has a particular job environment calling for special expertise on particular machinery, for example. Assuming that the user in this example wishes to make a special selection, he would input selection number "3" from the main category menu. At this point, the match system of the invention would display menu number 206 having the special qualifications selections. Menu 206 is a fixed format menu. The user would then select the special qualifications which most closely matched his requirements from menu 206 to display the detailed special qualifications. If the user were, for example, interested in a particular type of microprocessor chip, he may select number "8" HARDWARE.

Referring now to FIG. 5c, this selection would result in the display of menu 512 in FIG. 5c. Still referring to FIG. 5c, if the user's interest were in an employee with, for example, Motorola chip experience, he would input selection number "15" showing an availability of 23 potential employees. As in the other selection modes, the user would then be asked if he wanted to make another selection. In this case, let us assume that he wishes to select a second selection from menu 512. He could respond appropriately in response to a prompt by entering "Y" (for "yes"). He would then re-enter menu 512 as before and select, for example, MACINTOSH COMPUTER, showing an availability of 13. Assuming that his list of special qualifications was then exhausted, the user would then exit the special selection menus by responding "N" (for "no") to a prompt. Special selection menus available are listed on menu 206 in FIG. 2b.

Referring now to FIG. 2c the main menu screen 200 is shown at the point where, in this explanatory example, all of the above selections have been made. The screen now shows ELECTRONIC DIGIT —(71) in the job class selections box 201a, COMPUTER/MICROP—(275) in the industry selections box 201b, and MOTOROLA—(23) and MACINTOSH COMPUT—(13) in the special selections box 201c. At this point, the user can view all of his selections to ascertain whether or not his job criteria is matched as closely as possible. The user has the option of adding more categories in each of the selections 201a, 201b or 201c. If the user is satisfied with the selections he has made, he will then input selection "9" from the keyboard to enable the program to run the match.

Referring again to FIG. 1, at this point, the computer, using a logical formula looks at each of the temporary files 12, 22 and 32 for employee codes which are common to all three of these files. If an employee matches at least one category in each of the three temporary files, that employee will be considered a match for the job criteria selected. After all the employees meeting the above matching criteria have been selected, their employee numbers are compared to a fourth temporary file which contains the employees having company experience to the matched employees. This is for the purpose of merely printing out the company experience informa-

tion if applicable so that the user will know which matched employees have previously worked for the company requesting the information. Each of the selection criteria appearing in blocks 201a, 201b, and 201c is given a field number for the purposes of tracking against the employees as will be explained more in detail below. At block 100, the matched employee numbers are then merged through well known programming means with information from the personnel file 60 (optionally) and the client file 50 in order to display and/or print out a report in substantially the form of FIG. 6.

Referring now to FIG. 6, one example of a report displayed or printed by the computer software embodying the method of the invention is shown. The report includes a heading including the name of the client contact, in this case "Smith, Joe", the name of the client, "ABC Co.", the opening "ELECT.ENG." and certain code numbers including a requisition number "22222". Moving down the report, the next section includes an education code legend and the match criteria as selected in the above example. Note that each of the matched criteria selection has now been assigned a number which depends upon its particular position in the boxes 201a, 201b and/or 201c. For example, matched criteria ELECTRONIC DIGITAL ENGINEER—(71) has been assigned position number 1. ABC Co. experience—(68) has been assigned field number 10. In general field number 10 is reserved for the company experience matching.

Yet a third section of the report, moving down the page, includes the employee number under the heading FILE#, NAME, EXP, EDUC, RATE and the numbers "1", "4", "7" and "10" corresponding to the match criteria numbers. The file number column corresponds to the employee code. The employee's name will appear in the name column. The EXP column shows the years of experience of the employee since graduating from school or since commencing his or her career. The EDUC column contains the education code corresponding to the legend printed above on the form. The rate column states the hourly billing rate required for that particular personnel. The comments column is merely a column of blank lines for use by persons reading the report.

As can be seen by looking at FIG. 6, at least one name, NAME2 included matches designated by asterisks in all four of the match criteria including the experience column number 10. The other names listed on the report matched all of the criteria "1", "4" and "7".

At this point, if the user wishes to view or print out the resumes of any of the above candidates, means are provided to access the resume file 70 for printing out the candidates corresponding to the file number and name chosen. In this way resumes can be provided to carry along with the search report.

As can be discerned from the example detailed above, the program which embodies the method of the invention maintains a count of the number of files in each specific code. This is very important information. For example, it is possible that a job title may exist in the program for which there are no currently available employee candidates in the database. It can be appreciated that a search based upon a nullity is going to result in no matches unless it is logically "OR'd" with other selection categories. Conversely, if a category contains an extraordinarily high number of candidates which would precipitate an inordinately long review of re-

sumes, the user can continue the selection process to reduce this number.

For example, if the user were searching for digital electronic engineers, and if this category showed that more than 100 such candidates were available, the user would then try to reduce this number to a more reasonable quantity. If, for example, the user made a second choice which was an industrial selection for computers, and the user noted from the menu displayed that more than 350 employee candidates existed for this category, such a choice would probably not significantly reduce the number of available candidates since, more than likely, every digital engineer has had industrial experience in manufacturing computers. Therefore, the user might then want to add a specialty such as a particular brand name of CAD system which would have, for example, 20 candidates. Having this information, the user would now know that the total number of potential matching candidates would be no greater than 20 and, most likely, less than 20 since some of those will not, in all probability be digital engineers. At this point, the user can run a match and would, for example, receive a report showing 9 or 10 candidates that met all three of the requirements. The user could then review the list and eliminate some of the candidates on the basis of total experience, for example, or on the basis of their hourly rate which would be visible on the CRT screen. If this approach did not reduce the list sufficiently, the criteria could be revised to either increase or decrease the number of candidates depending upon the desired end result.

Another reason for the desirability of reporting the quantity of persons available in any given category may be appreciated by the following example. Assume the user is searching in a specific category and the program menu displayed indicates that there are no more than six people in the specified category. He would probably search no further until he had checked out the resumes and experience of those six candidates. In this way he could greatly reduce the amount of time necessary for a search.

Referring now to FIG. 7, the system embodying the method of the invention can be used to generate other reports such as the database status report shown. Generation of this report would be accomplished using the file structure shown in FIG. 1a and equipment shown in FIG. 1c. A menu, similar to the job title menus described herein would be displayed on the screen containing broad categories of candidates in English. If a user was in the planning stages of a large product, he may not be interested in the actual names of people since they may not be ready to hire during the planning stages. Further, when the project did come to fruition, the currently available candidates would probably be unavailable due to the passage of time. However, the customer may want a sample of the market at the moment to aid in planning. The database status report would indicate the total number of candidates currently available and also list the average billing rate, the high billing rate, and the low billing rate for those candidates. For example, if the customer were interested only in mechanical engineers, the database status report would provide information as to the number of mechanical engineers available, and the corresponding billing rate information. This report can be done on broad categories of selection criteria including industrial experience and special skills so that for budgetary or planning purposes, the user will have useful information on

the current status of the labor market. Such database status reports may also be run optionally on a periodic basis, such as weekly, to be used as a tool in over-viewing the numbers and types of candidates available in the system.

Again drawing attention to FIG. 1a, note that the system includes a follow-up file 105. Data for the follow-up file is generated for each search run on the program embodying the method of the invention. The follow-up file includes English and coded information including the customer number, the customer name, the selection criteria used in the search, cover sheet, or background information as supplied by the customer and the employee codes for all employees matched by the search program. This information is then used by the search firm employing the system of the invention to generate a follow-up report. Drawing attention now to FIG. 8, a follow chart of the method of the system of the invention used to generate such a follow-up report is shown. Using the preferred embodiment of the system of the invention as described above, the method of the invention first checks all available employee candidates against the selection criteria contained in the follow-up file at step 602. The program then updates the follow-up file at step 604 by adding any new candidates found to match the selection criteria. Next, at step 606, all candidates now contained in the follow-up file are tagged as "original", "not available", and "added". An "original" tag means that a candidate was found in the original run of the search report against the same criteria, a "not available" tag indicates that an employee was previously found in a prior search but has since been removed from the database of available candidates and an "added" tag indicates that this employee candidate has been added since the previous search. That is, an "added" employee candidate would not have had records residing on the available data file during the last run of the search being followed up. At step 608 a report is generated which is very similar to the report shown in FIG. 6 with the addition of the "original", "not available" and "added" tags appearing by each employee name.

The system may be used to perform other functions related to employee candidate searches. Again, drawing attention to FIG. 1a, file number 101, open job requirements, is shown. As is the case with the follow-up file 105, the open job requirements file is generated by the search program of the invention upon the completion of a job requirement search. The open job requirements file contains information similar to the follow-up file including customer name, customer number and job criteria divided into special SIC and job title databases, as well as "cover sheet" or "background information". The information contained in the open job requirements file is used to run a "reverse match" program using the system embodying the method of the invention. This is typically done at the point in time when information on the employee candidate is initially introduced into the system. This information may be entered by the candidates themselves since the program is designed to prompt all needed information from the user thereby guiding the user through the program using a series of helpful prompts. The system then encodes the information entered by the candidate and, upon completion of the input phase may run a reverse match such as is shown in flow-chart form in FIG. 9.

Referring now to FIG. 9, the employee may input his information as required by the screen prompts including

experience, special skills, etc. at step 650. Once the input phase is completed, the program will compare the employee qualification with all of the open job requirements files to ascertain whether or not any matches occur. This is done generally in the same manner as a search as described above except that the selection criteria are contained within the open job requirements files and are not individually entered by a user from the keyboard. This comparison is done at step 652. If any matches are found, the program will then display the matched open jobs at step 654 and generate a report at step 656.

This invention has been described herein in considerable detail in order to comply with the Patent Statutes and to provide those skilled in the art with the information needed to apply the novel principles and to construct and use such specialized components as are required. However, it is to be understood that the invention can be carried out by specifically different equipment and devices, and that various modifications, both as to the equipment details and operating procedures, can be accomplished without departing from the scope of the invention itself. For example, the system could be reorganized to search a first selection criterion and establish a single temporary file based on that first criterion. The system could then allow inputs of further selection criteria, for example second and third criteria, and apply that subsequent criteria only to a search of the single temporary file which was created from the initial search. Such a system would be very fast since it operates by constantly reducing the files in use. However, such a system would not be as flexible as the preferred embodiment described herein since its sequential nature makes each temporary file generated dependent upon the file before it. In contrast, the preferred embodiment establishes three temporary files and looks for a common employee code in all three files. Any one of the three files can be altered or reviewed without affecting the other two since they are not sequential in nature.

Another alternate embodiment of the method of the invention includes using a personal database with one record for each candidate instead of the first, second and third data files 10, 20 and 30 used in the preferred

embodiment. In such an alternate system, each record would contain individual fields for information including job classification codes, industrial experience, starting date and technical employment, pay rate, equal opportunity employment information, type of employment desired, and other pertinent information. The system of this alternate embodiment sort through all individual records and stores temporarily only those people who match the encoded job description, industrial description and special skills. In contrast to the preferred embodiment, this alternative embodiment cannot ignore files not necessary to the selection criteria. Whereas the preferred method directs the computer to find a certain number and to establish a temporary file, only for those candidates that match the certain number. Therefore, using the preferred embodiment, the computer only has to search a very limited number of files whereas using the alternate embodiment where each applicant has a rather lengthy file, the computer must search through all of the records in each file in order to assure that a potential candidate is not overlooked.

The aforesaid alternative embodiment also requires reservation of a fixed amount of memory for each employee candidate, regardless of experience. This result in a compromise situation wherein there is usually too much computer memory reserved for a beginner and frequently not enough space for a very experienced employee candidate. As can be appreciated by those skilled in the art, the preferred method of the invention is not so restricted since any number of entries can be made in each classification for each employee. Therefore, each employee can have any number of records in a given file or no records depending upon his or her qualifications. The difference in organization between the alternate embodiment and the preferred embodiment results in an improvement on the order of 4 to 1 in run time for the preferred embodiment. For example, a search that the alternate embodiment requires eight minutes to perform can be done in approximately two minutes using the preferred embodiment.

What is claimed is:

Appendix TABLE VIII-1

list Record #	DESCRIPTION	CODE	I	CNT	MKY
193	METROLOGY TECHNICIAN	012260013	T	1	0
198	TEACHER, SECONDARY SCHOOL	091227010	M	0	
199		005061017		0	
200		003181101		0	
238	UNASSIGNED	822500000	C	0	
239	UNASSIGNED	822600000	C	0	
240	UNASSIGNED	822700000	C	0	
250	ACCOUNTING CLERK	216482010	M	0	
253		019067018		1	
254		07067014N		0	
255		007180026		0	
256				5	
257	ACCOUNTANT	160167026		0	
258		020061014		1	
259		008160014		1	
261	CERTIFIED PUBLIC ACCOUNTANT	160167014	M	1	
262	ELECTRICIAN	84261010			
1	ARCHITECT	001061010	E	4	1010001
2	LANDSCAPE ARCHITECT	001061018	E	0	1010002
8	AERONAUTICAL ENGINEER	002061014	E	6	1020001
9	AERONAUTICAL DESIGN ENGR*	002161014	E	0	1020002
30	CIVIL ENGINEER	005061014	E	11	1030001
33	CIVIL DESIGN ENGR*	005161014	E	1	1030002
152	CONSTRUCTION ENGINEER	005061019	E	7	1030003
153	CONSTRUCTION ENGR*	005161019	E	2	1030004
31	STRUCTURAL ENGINEER	005061034	E	10	1030005
34	STRUCTURAL DESIGN ENGR*	005161034	E	4	1030006



Appendix TABLE VIII-1-continued

list Record #	DESCRIPT	CODE	I	CNTI	MKY
197	WATERWORKS ENGINEER	005067010	E	0	1030007
196	WATERWORKS ENGR*	005167010	E	0	1030008
13	ELECTRICAL POWER ENGINEER	003061018	E	10	1040001
23	ELECTRICAL POWER DESIGN ENGR*	003161018	E	6	1040002
12	ELECTRICAL START-UP ENGINEER	003061009	E	3	1040003
22	ELECTRICAL START-UP ENGR*	003161009	E	1	1040004
15	ELECTRONIC ANALOG ENGINEER	003061037	E	26	1050001
25	ANALOG DESIGN ENGR*	003161037	E	4	1050002
10	ELECTRONIC COMPONENT ENGINEER	003061003	E	1	1050003
20	ELECTRONIC COMPONENT ENGR*	003161003	E	2	1050004
16	ELECTRONIC DIGITAL ENGINEER	003061039	E	96	1050005
26	DIGITAL DESIGN ENGR*	003161039	E	16	1050006
14	ELECTRONIC LOGIC ENGINEER	003061035	E	3	1050007
24	LOGIC DESIGN ENGR*	003161035	E	1	1050008
11	ELECTRONIC MFRG ENGINEER	003061005	E	4	1050009
21	ELECTRONIC MFRG ENGR*	003161005	E	0	1050010
139	ELECTRONIC QUALITY ENGINEER	003067054	E	5	1050011
161	ELECTRONIC QUALITY ENGR*	003167054	E	0	1050012
17	ELECTRONIC TEST ENGINEER	003061042	E	15	1050013
27	ELECTRONIC TEST ENGR*	003161042	E	5	1050014
175	I & C ENGINEER	003061011	E	3	1050015
176	I & C ENGR*	003161011	E	0	1050016
138	BSET, BSIT	003061099	E	10	1050017
117	PHYSICIST	023061014	E	9	1050018
143	CONFIGURATION ENGINEER	012067010	E	2	1060001
156	CONFIGURATION ENGR*	012167010	E	2	1060002
162	COST ESTIMATING ENGINEER	012067048	E	7	1060003
163	COST ESTIMATING ENGR*	012167048	E	1	1060004
93	FACILITIES PLANNER ENGINEER	019061018	E	13	1060005
103	FACILITIES PLANNER ENGR*	019161018	E	5	1060006
65	INDUSTRIAL ENGINEER	012067030	E	24	1060007
74	INDUSTRIAL ENGINEER	012167030	E	11	1060008
66	MANUFACTURING ENGINEER	012067042	E	44	1060009
75	MANUFACTURING ENGR*	012167042	E	32	1060010
71	MATERIAL PLANNING ENGINEER	012087010	E	0	1060011
80	MATERIAL PLANNING ENGR*	012187010	E	1	1060012
142	N-C PROGRAMMER	007067018	M	0	1060013
53	N C PROGRAMMER*	007167018	M	4	1060014
67	PRODUCTION ENGINEER	012067046	E	10	1060015
76	PRODUCTION ENGR*	012167046	E	12	1060016
66	PRODUCTION SCHEDULER	012067050	M	6	1060017
77	PRODUCTION SCHEDULER*	012167050	M	5	1060018
63	QA START-UP ENGINEER	012061009	E	0	1060019
72	QA START-UP ENGR*	012161009	E	0	1060020
69	QUALITY ENGINEER	012067054	E	24	1060021
78	QUALITY ENGR*	012167054	E	14	1060022
64	SAFETY ENGINEER	012061014	E	4	1060023
73	SAFETY ENGR*	012161014	E	1	1060024
70	TOOLING PLANNING ENGINEER	012067074	E	4	1060025
79	TOOLING PLANNER ENGR*	012167074	E	3	1060026
43	HEAT TRANSFER ENGINEER	007081010	E	0	1070001
54	HEAT TRANSFER ENGR*	007181010	E	0	1070002
38	MECHANICAL HVAC ENGINEER	007061018	E	3	1070003
48	HVAC-FACILITIES DESIGN ENGR*	007161018	E	4	1070004
141	MECHANICAL START-UP ENGINEER	007061009	E	1	1070005
47	MECHANICAL START-UP ENGR*	007161009	E	0	1070006
42	PLANT ENGINEER	007067014	E	4	1070007
52	PLANT ENGR*	007167014	E	6	1070008
41	E-M PACKAGING ENGINEER	007061044	E	4	1070009
39	MECHANICAL ENGINEER	007061022	E	41	1070010
40	TOOLING ENGINEER	007061026	E	1	1070011
91	BIOMEDICAL ENGINEER	019061010	E	1	1080001
101	BIOMEDICAL ENGR*	019161010	E	0	1080002
173	CAD IMPLEMENTATION ENGINEER	019041010	E	2	1080003
174	CAD IMPLEMENTATION ENGR*	019141010	E	2	1080004
140	CERAMIC ENGINEER	006061014	E	1	1080005
191	CERAMIC ENGR*	006161014	E	0	1080006
57	CHEMICAL ENGINEER/CHEMIST	008061018	E	38	1080007
190	CHEMICAL ENGR/CHEM*	008161018	E	0	1080008
171	CIM/CAM IMPLEMENTATION ENGINEER	019041020	E	0	1080009
172	CIM/CAM IMPLEMENTATION ENGR*	019141020	E	0	1080010
92	COMPONENT ENGINEER	019061014	E	3	1080011
102	COMPONENT ENGR*	019161014	E	0	1080012
145	DOCUMENTATION ENGINEER	019067015	E	5	1080013
187	DOCUMENTATION ENGR*	019167015	E	1	1080014
95	ENGINEERING PROJECT MANAGER	019067014	E	44	1080015
105	ENGINEERING PROJECT MANAGER*	019167014	E	11	1080016
167	HUMAN FACTORS ENGINEER	045061014	E	0	1080017
168	HUMAN FACTORS ENGR*	045161014	E	0	1080018
94	LOGISTICS ENGINEER	019067010	E	1	1080019



Appendix TABLE VIII-1-continued

list Record #	DESCRIPT	CODE	I	CNT1	MKY
104	LOGISTICS ENGR*	019167010	E	2	1080020
96	MAINTAINABILITY ENGINEER	019081010	E	2	1080021
106	MAINTAINABILITY ENGR*	019181010	E	1	1080022
179	MATERIALS ENGINEER	019061015	E	5	1080023
180	MATERIALS ENGR*	019161015	E	1	1080024
60	METALURGICAL ENGINEER	011061022	E	2	1080025
155	METALURGICAL ENGR*	011161022	E	0	1080026
159	NUCLEAR ENGINEER	015061014	E	0	1080027
192	NUCLEAR ENGR*	015161014	E	0	1080028
144	OPTICAL ENGINEER	019061028	E	0	1080029
165	OPTICAL ENGR*	019161028	E	0	1080030
100	PACKAGING ENGINEER	019087010	E	5	1080031
110	PACKAGING ENGR*	019187010	E	1	1080032
97	PHOTOGRAPHIC ENGINEER	019081014	E	1	1080033
107	PHOTOGRAPHIC ENGR*	019181014	E	0	1080034
98	POLLUTION CONTROL ENGINEER	019081018	E	2	1080035
108	POLLUTION CONTROL ENGR*	019181018	E	1	1080036
99	RELIABILITY ENGINEER	019081022	E	7	1080037
109	RELIABILITY ENGR*	019181022	E	2	1080038
59	WELDING ENGINEER	011061026	E	0	1080039
61	WELDING ENGR*	011161026	E	1	1080040
251	ENVIRONMENTAL ANALYST	029081010	E	5	1080041
252	PETROLEUM ENGINEER	010061018	E	2	1080042
3	ENERGY TECHNICIAN	001160010	T	0	2010001
186	PLANT-HVAC TECHNICIAN	007160014	T	4	2010002
32	CIVIL TECHNICIAN	005160014	T	2	2030001
194	LAND SURVEYOR	018167018	T	0	2030002
195	HYDROGRAPHER	025264010	T	0	2030003
18	ELECTRICAL TECHNICIAN	003160010	T	8	2040001
19	ELECTRONIC TECHNICIAN	003160014	T	153	2050001
177	I & C TECHNICIAN	003260011	T	1	2050002
188	MICROSCOPIC INSPECTOR	711280010	T	0	2050003
81	I. E. TECHNICIAN	012260010	T	3	2060001
82	QUALITY TECHNICIAN	012260014	T	27	2060002
132	FLUID POWER TECHNICIAN	600280010	T	0	2070001
148	INSPECTOR	710380038	T	24	2070002
133	MACHINIST	600280022	T	7	2070003
45	MECHANICAL TECHNICIAN	007160026	T	27	2070004
135	MODEL MAKER	777260010	T	7	2070005
134	TOOL MAKER	601280042	T	7	2070006
137	WELDER	819384010	T	3	2070007
185	BIOCHEM TECH	041160026	T	1	2080001
58	CHEMICAL TECHNICIAN	008260010	T	19	2080002
166	ELEC ASSY/SOLDERER	800380010	T	11	2080003
62	METALURGICAL TECHNICIAN	011260010	T	2	2080004
147	MICROBIOLOGY TECHNICIAN	078260014	T	1	2080005
129	NON-DESTRUCTIVE TECH	199360010	T	7	2080006
160	NUCLEAR PLANT TECHNICIAN	710280030	T	0	2080007
46	OPTICAL TECHNICIAN	007160030	T	0	2080008
118	PHOTO-OPTICAL TECHNICIAN	029280010	T	4	2080009
178	POLLUTION CONTROL TECHNICIAN	029260014	T	0	2080010
136	SOLDERER	813380010	T	6	2080011
111	BUSINESS PROGRAMMER	020062014	P	20	3010001
114	BUSINESS PROGRAMMER*	020162014	P	11	3010002
112	DATA PROCESSING MANAGER	020067018	P	0	3010003
115	DP BUSINESS MANAGER*	020167018	P	0	3010004
260	NETWORK PROGRAMMER	020062015	P	1	3010005
146	ELECTRONIC SOFTWARE ENGINEER	020067003	P	51	3020001
164	ELECTRONIC SOFTWARE ENGR*	020167003	P	7	3020002
113	SCIENTIFIC PROGRAMMER	020067022	P	75	3020003
116	SCIENTIFIC PROGRAMMER*	020167022	P	27	3020004
181	STATISTICIAN	020067026	P	5	3020005
182	STATISTICIAN*	020167026	P	0	3020006
4	ARCHITECTURAL DESIGNER	001161010	D	4	4010001
6	ARCHITECTURAL DRAFTER	001261010	D	20	4010002
86	HVAC DRAFTER	017261034	D	11	4010003
5	LANDSCAPE DESIGNER	001161018	D	0	4010004
7	LANDSCAPE DRAFTER	001261014	D	0	4010005
88	PIPING DESIGN DRAFTER	017281030	D	14	4010006
85	PLANT LAYOUT DRAFTER	017261026	D	16	4010007
87	PLUMBING DRAFTER	017261038	D	3	4010008
150	SPRINKLER DESIGN DRAFTER	017281038	D	2	4010009
90	CARTOGRAPHIC DRAFTER	018261010	D	0	4030001
35	CIVIL DRAFTER	005281010	D	4	4030002
36	STRUCTURAL DRAFTER	005281014	D	18	4030003
28	ELECTRICAL DRAFTER	003281010	D	15	4040001
29	ELECTRONIC DRAFTER	003281014	D	22	4050001
154	PRINTED CIRCUIT DESIGNER	003181014	D	22	4050002
83	CHECKER	017161010	D	7	4070001
51	E-M PACKAGING DESIGNER	007161044	D	26	4070002

Appendix TABLE VIII-1-continued

list Record #	DESCRIPT	CODE	I	CNTI	MKY
149	ELECTRO-MECHANICAL DRAFTER	017261044	D	15	4070003
49	MECHANICAL DESIGNER	007161022	D	56	4070004
56	MECHANICAL DETAIL DRAFTER	007281010	D	30	4070005
84	MECHANICAL LAYOUT DRAFTER	017261014	D	47	4070006
50	TOOLING DESIGNER	007161026	D	24	4070007
55	TOOLING DRAFTER	007261022	D	7	4070008
169	GRAPHIC DESIGNER	141061018	M	1	4080001
170	GRAPHIC DESIGNER*	141161018	M	3	4080002
125	INDUSTRIAL DESIGNER	142061026	M	1	4080003
158	INDUSTRIAL DESIGNER*	142161026	M	0	4080004
124	INTERIOR DESIGNER	142051014	M	0	4080005
126	INTERIOR DESIGNER*	142151014	M	0	4080006
151	PROPOSAL WRITER	131067028	M	2	4080007
157	PROPOSAL WRITER*	131167028	M	1	4080008
127	PURCHASING/BUYER	162057038	M	6	4080009
128	PURCHASING/BUYER*	162157038	M	6	4080010
37	SALES ENGINEER	007051015	M	10	4080011
44	SALES ENGR*	007151015	M	6	4080012
122	TECHNICAL EDITOR	132067018	M	4	4080013
123	TECHNICAL EDITOR*	132167018	M	1	4080014
120	TECHNICAL WRITER	131067026	M	20	4080015
121	TECHNICAL WRITER*	131167026	M	18	4080016
130	DRAFTING/CONTROL CLERK	206367010	D	0	4080017
131	COMPUTER OPERATOR*	213362010	M	1	4080018
89	TECHNICAL ILLUSTRATOR	017281034	D	9	4080019
119	INSTRUCTOR*	097227014	M	12	4080020
183	TELEPHONE EXPERIENCE	822001002	C	1	5010001
201	CABLE PLACEMENT TECHNICIAN	822100001	C	0	5020001
202	CABLE SPLICER INSTALLATION	822100002	C	0	5020002
203	CABLE SPLICER REPAIR	822100003	C	0	5020003
204	CABLE SPLICER FIBER	822100004	C	0	5020004
205	CONSTRUCTION SUPERVISOR	822100005	C	0	5020005
206	DISTRIBUTION ENGINEER-ASSOCIATE	822100010	C	0	5020006
207	DISTRIBUTION ENGINEER	822100011	C	0	5020007
208	DISTRIBUTION ENGINEER-PLANNING	822100020	C	0	5020008
209	REPAIR CLERK	822200000	C	0	5030001
210	STATION EQUIPMENT TECH.-INSTALLATION	822200001	C	0	5030002
211	STATION EQUIPMENT TECH.-REPAIR	822200002	C	0	5030003
212	STATION KEY EQUIPMENT TECHNICIAN	822200003	C	0	5030004
213	STATION EQUIPMENT-COIN	822200006	C	0	5030005
214	STATION EQUIPMENT-DATA	822200007	C	0	5030006
215	MOBILE RADIO CELLULAR	822200008	C	0	5030007
216	TECHNICIAN CABLE TV	822200009	C	0	5030008
217	PRIVATE BRANCH EXECUTIVE-INSTALL.	822300001	C	0	5040001
218	PRIVATE BRANCH EXCHANGE-REPAIR	822300002	C	0	5040002
219	PRIVATE BRANCH EXCHANGE-ENGINEER	822300010	C	0	5040003
220	PRIVATE BRANCH EXCHANGE-SUPERVISOR	822300011	C	0	5040004
221	PREMISES SERVICE CONSULTANT	822300012	C	0	5040005
222	INSTRUCTOR-PBX	822300013	C	0	5040006
223	CENTRAL OFFICE INSTALLATION	822400001	C	0	5050001
224	CENTRAL OFFICE REPAIR	822400002	C	0	5050002
225	CENTRAL OFFICE TECHNICIAN-FRAME	822400003	C	0	5050003
226	CENTRAL OFFICE TECHNICIAN-SWITCHING	822400004	C	0	5050004
227	CENTRAL OFFICE TECHNICIAN-TOLL	822400005	C	0	5050005
228	CENTRAL OFFICE TECHNICIAN-MICROWAVE	822400006	C	0	5050006
229	CENTRAL OFFICE SUPERVISOR	822400009	C	0	5050007
230	CENTRAL OFFICE EQUIP.-ENG. ASSOCIATE	822400010	C	0	5050008
231	CENTRAL OFFICE EQUIP.-ENG-FACILITIES	822400011	C	0	5050009
232	CENT. OFFICE EQUIP. ENG.-SWITCHING	822400012	C	0	5050010
233	CENT. OFFICE EQUIP. ENG.-TOLL	822400013	C	0	5050011
234	CENTRAL OFFICE EQUIP. ENG.-MICROWAVE	822400014	C	0	5050012
235	CENTRAL OFFICE EQUIP. ENG.-PLANNING	822400020	C	0	5050013
236	CENT. OFFICE FAC. ENG.-PLANNING	822400021	C	0	5050014
237	BUILDING ENGINEER	822400030	C	0	5050015
241	COMPUTER-CLERICAL	822800001	C	0	5060001
242	COMPUTER-TECHNICIAN	822800002	C	0	5060002
243	COMPUTER-PROGRAMMER	822800003	C	0	5060003
244	COMPUTER SYSTEMS ANALYST	822800004	C	0	5060004
245	INSTRUCTOR-NETWORK	822900001	C	0	5070001
246	INSTRUCTOR TRAINING DELIVERY	822900002	C	0	5070002
247	INSTRUCTOR TRAINING DEVELOPER	822900003	C	0	5070003
248	TECHNICAL WRITER	822900004	C	0	5070004
249	MARKETING	822900009	C	0	5070005
184	BIOCHEMIST	041061026	M	5	6000001
189	TO SOLVE EOF ERROR IN GENFM612	-----		0	7000001

Appendix TABLE VIII-2

list Record #	DESCRIPT	CODE	CNTI	MKY
132	ALL MINING.	10	0	0
133	ALL GENERAL CONSTRUCTION.	15	0	0
134	ALL SPECIAL CONSTRUCTION.	16	0	0
135	ALL TRADES CONTRACTORS.	17	0	0
136	ALL FOOD PROCESSING.	20	0	0
137	ALL WOOD PRODUCTS.	24	0	0
138	ALL CHEMICALS.	28	0	0
139	ALL PLASTIC/RUBBER.	30	0	0
140	ALL CERAMICS.	32	0	0
141	ALL PRIMARY METAL INDUSTRY.	33	0	0
142	ALL FABRICATED METALS.	34	0	0
143	ALL MACHINERY/COMPUTERS.	35	0	0
144	ALL ELECTRICAL/ELECTRONICS.	36	0	0
145	ALL TRANSPORTATION EQUIP.	37	0	0
146	ALL INSTRUMENTATION.	38	0	0
147	ALL TELEPHONE/BROADCASTING.	48	0	0
148	ALL UTILITIES. (EXCEPT TEL).	49	0	0
149	ALL BUSINESS SERVICES.	73	0	0
150	ALL FACILITIES/CONSTRUCTION.	89	0	0
152	ALL FURNITURE.	25	0	0
165	PACKAGING SERVICE	7399	3	
166	FOOD CONTAINERS	2654	0	
167	MFRG MISC.	3999	2	
169	CASH REGISTERS	3574	3	
170	SURVEYING: LAND, WATER, AERIAL	8713	0	
171	SURVEYING INSTRUMENTS	3829	1	
172	HYDROLOGY PROJECTS	1627	12	
173			17	
174		2988	0	
175	NSP EXPERIENCE	KN	0	
176	STATISTICAL PROCESS CONTROL	SP	0	
177	GEOMETRIC TOLERANCING	GT	0	
178	STORE/OFFICE FIXTURES NON-WOOD	2542	2	
179	OFFICE/STORE FIXTURES WOOD	2541	1	
180	ELECTRICAL INDUSTRIAL EQUIP	3629	2	
181	NEWSPAPER PUBLISHING	2711		
1	MINING (IRON)	1011	1	11010001
162	ARCHITECTURAL/CONSTRUCTION	8911	64	11020001
7	BRIDGE CONSTRUCTION	1622	3	11020002
5	COMMERCIAL CONSTRUCTION	1542	36	11020003
52	CONCRETE	1771	10	11020004
11	ELECTRICAL CONSTRUCTION	1731	1	11020005
6	HIWAY-STREET CONSTRUCTION	1611	4	11020006
9	HVY INDUSTRIAL CONSTRUCTION	1629	29	11020007
10	MECHANICAL CONTRACTORS	1711	2	11020008
4	MFRG-WHSE CONSTRUCTION	1541	1	11020009
3	MULTIPLE DWELLINGS	1522	1	11020010
8	PIPING/CONSTRUCTION	1623	23	11020011
2	RESIDENTIAL CONSTRUCTION	1521	16	11020012
53	STEEL	1791	9	11020013
51	STONWORK	1741	1	11020014
125	ELECTRICAL UTILITY	4911	22	11030001
126	GAS UTILITY	4922	2	11030002
127	SEWER-WASTE SYSTEMS	4953	19	11030003
56	TELEPHONE UTILITY	4811	2	11030004
130	DATA PROCESSING SERVICE	7374	2	11040001
131	MANAGEMENT CONSULTING	7392	7	11040002
129	PROGRAMMING SERVICE	7372	11	11040003
128	TEMP HELP SERVICE	7362	11	11040004
153	METAL FURNITURE	2522	1	11050001
124	TOYS, GAMES	3944	9	11050002
151	WOOD FURNITURE	2521	1	11050003
15	CANNING	2030	0	12010001
14	DAIRY PROCESSING	2020	0	12010002
16	GRAIN/CEREAL PRODUCTS & PROCESSES	2041	20	12010003
12	MEAT PACKING	2011	0	12010004
13	POULTRY PROCESSING	2017	0	12010005
163	CORRUGATED BOXES	2653	4	12020001
155	STRUCTURAL WOOD PRODUCTS	2439	2	12020002
17	WOOD MILLWORK	2431	0	12020003
164	WOOD PALLETS	2448	0	12020004
55	CERAMICS/SILICON	3264	14	12030001
18	CHEMICALS/PETROLEUM	2899	78	12030002
157	GLASS	3211	3	12030003
19	PLASTIC/RUBBER	3079	85	12030004
25	ALUMINUM	3350	7	12040001
26	BRASS/BRONZE/COPPER	3362	1	12040002
27	CASTINGS	3369	20	12040003
22	GRAY IRON FOUNDRIES	3321	0	12040004
23	MALLEABLE IRON FOUNDRIES	3322	0	12040005

Appendix TABLE VIII-2-continued

list Record #	DESCRIPT	CODE	CNT	MKY
28	METAL HEAT TREATING	3398	0	12040006
20	ROLLING MILLS	3312	0	12040007
24	STEEL FOUNDRIES	3325	1	12040008
21	STEEL PIPE/TUBING	3317	2	12040009
37	ARCHITECTURAL METALS	3446	6	12050001
33	FABRICATED STRUCTURAL METAL	3441	13	12050002
39	FORGINGS	3462	0	12050003
30	HANDSAW/BLADES	3425	0	12050004
156	MACHINED PARTS	3451	33	12050005
29	METAL CANS	3411	1	12050006
54	METAL COATING	3479	5	12050007
34	METAL DOORS	3442	0	12050008
38	METAL FASTENERS	3452	0	12050009
40	METAL STAMPINGS	3469	9	12050010
31	MISC. HARDWARE	3429	0	12050011
32	MISC. HEATING EQUIPMENT	3433	1	12050012
42	ORDNANCE-WEAPONS-MUNITIONS	3489	59	12050013
41	PLATING/FINISHING	3471	19	12050014
36	SHEET METAL	3444	46	12050015
35	STEEL PLATE/PRESSURE VESSELS	3443	19	12050016
43	STEEL SPRINGS	3493	0	12050017
44	VALVES/FITTINGS	3494	7	12050018
46	WIRE PRODUCTS	3496	2	12050019
45	WIRE SPRINGS	3495	1	12050020
74	BLOWERS/FANS	3564	6	12060001
82	BUSINESS MACHINES	3579	18	12060002
84	COMML LAUNDRY MACHINES	3582	0	12060003
73	COMPRESSORS/NOZZELS/SPRAY	3563	8	12060004
80	COMPUTERS/MICROPROCESSORS	3573	333	12060005
50	CONSTRUCTION EQUIPMENT	3531	17	12060006
58	CONVEYORS/MATERIAL HANDLING	3535	41	12060007
63	DIES/MOLDS/FIXTURES	3544	48	12060008
158	ELEVATORS	3534	0	12060009
48	FARM MACHINERY	3523	14	12060010
65	FOOD MACHINERY	3551	22	12060011
49	LAWN MAINTENANCE/SNOW REMOVAL EQUIP	3524	6	12060012
76	GEARS/DRIVES/REDUCERS	3566	1	12060013
59	HOIST. CRANES. MONORAILS	3536	16	12060014
85	INDUSTRIAL COMMLHVAC EQUIPMENT	3585	22	12060015
75	INDUSTRIAL PATTERNS	3565	0	12060016
77	INDUSTRIAL PROCESS FURNACES	3567	4	12060017
86	INDUSTRIAL SERVICE MACHINES	3589	6	12060018
60	INDUSTRIAL TRUCKS-STACKERS-LIFTS	3537	3	12060019
47	INTERNAL COMBUSTION ENGINES	3519	7	12060020
61	METAL CUTTING TOOLS	3541	6	12060021
62	METAL FORMING TOOLS	3542	1	12060022
57	MINING EQUIPMENT	3532	1	12060023
78	POWER TRANSMISSION ACCESSORIES	3568	2	12060024
69	PRINTING MACHINES	3555	11	12060025
71	PUMPS	3561	14	12060026
72	ROLLER/BALL BEARINGS	3562	2	12060027
81	SCALES/BALANCES	3576	0	12060028
70	SPECIAL MACHINES	3559	51	12060029
66	TEXTILE MACHINERY	3552	0	12060030
64	TOOL MEASURING DEVICES	3545	3	12060031
79	TYPEWRITERS/WORD PROCESSORS	3572	9	12060032
83	VENDING MACHINES	3581	1	12060033
68	WEB-PAPER MACHINES	3554	14	12060034
160	WELL SCREENS/DRILLING EQUIPMENT	3533	2	12060035
67	WOODWORKING MACHINERY	3553	1	12060036
100	BATTERIES	3691	7	12070001
95	COMML/LIGHTING FIXTURES	3646	2	12070002
97	COMMUNICATIONS/RF/RADAR	3662	124	12070003
91	CONSUMER APPLIANCES	3631	39	12070004
90	CONTROLS	3622	102	12070005
92	ELECTRICAL COMPONENTS	3643	30	12070006
93	ELECTRICAL ENCLOSURES	3644	3	12070007
102	ENGINE ELECTRICAL EQUIPMENT	3694	8	12070008
88	I.C. CIRCUIT HANDLERS/SWITCHGEAR	3613	6	12070009
99	MAGNETIC ELECTRONICS/PCB-PWB'S	3679	275	12070010
101	MEDICAL ELECTRONICS	3693	58	12070011
89	MOTOR/GENERATOR/TURBINES	3621	51	12070012
94	RESIDENTIAL LIGHTING FIXTURE	3645	1	12070013
98	SEMI-CONDUCTORS/I.C.'S	3674	45	12070014
96	TELEPHONE EQUIPMENT	3661	25	12070015
87	TRANSFORMERS/POWER SUPPLIES	3612	54	12070016
107	AIRCRAFT	3724	51	12080001
108	AIRCRAFT PARTS	3728	6	12080002
103	AUTOMOBILES	3711	4	12080003
104	BUS/TRUCKS	3713	2	12080004

Appendix TABLE VIII-2-continued

list Record #	DESCRIPT	CODE	CNT1	MKY
113	MISC. VEHICLES	3799	10	12080005
111	MISSILE PROPULSION	3764	3	12080006
112	MISSILES/SPACECRAFT	3769	30	12080007
110	RAILROAD EQUIPMENT	3743	10	12080008
109	SHIPS	3731	2	12080009
159	TANKS/ARMORED/TRACKED VEHICLES	3795	7	12080010
106	TRUCK TRAILERS	3715	0	12080011
105	VEHICLE PARTS/ACCESSORIES	3714	8	12080012
117	AUTOMATIC TEST EQUIPMENT	3825	108	12090001
114	AVIONICS/TEST SYSTEMS	3811	69	12090002
154	COUNTING & FLOW METERS	3824	1	12090003
121	DENTAL EQUIPMENT	3843	0	12090004
115	ENVIRONMENTAL-HVAC CONTROLS	3822	21	12090005
116	INSTRUMENTATION	3823	53	12090006
119	MEDICAL INSTRUMENTS	3841	17	12090007
118	OPTICAL INSTRUMENTS	3832	0	12090008
161	OPTICS	3851	7	12090009
120	ORTHOPEDIC/SURGICAL APPLIANCES	3842	5	12090010
122	PHOTOGRAPHIC EQUIPMENT	3861	33	12090011
123	WATCHES/CLOCKS	3873	2	12090012
168	IN TO SOLVE EOF ERROR IN GENFM652	----	0	13000001

Appendix TABLE VIII-3

list Record #	DESCRIPT	CODE	CNT1	MKY
181			13	
182			13	
183		6666	1	
41	ALL CAD	CC	122	21000001
36	ADAGE CAD	45	0	21000002
39	ALTOS (FRONTIER) CAD	48	0	21000003
166	ANVIL CAD	74	0	21000004
25	APOLLO CAD	32	8	21000005
1	APPLICON CAD	01	2	21000006
186	ARRIS CAD	83	0	21000007
30	AUTOCAD	39	50	21000008
2	AUTOTROL CAD	02	2	21000009
31	BELLCAD	40	1	21000010
38	BRUNING CAD	47	0	21000011
144	CADKEY	56	3	21000012
29	CADNETIX	37	1	21000013
141	CADVANCE	52	2	21000014
27	CALAY CAD	34	2	21000015
159	CALCOMP/ISICAD	67	0	21000016
126	CALMA ADVANCE CAD	49	0	21000017
22	CALMA DAL CAD	27	1	21000018
21	CALMA DDM CAD	26	1	21000019
3	CALMA GDS I CAD	03	1	21000020
4	CALMA GDS II CAD	04	2	21000021
157	CASE CAD	65	0	21000022
149	CD2000/DDN ANVIL CAD	59	3	21000023
9	COMPUTOOL/CAMAX CAD	09	0	21000024
5	CV CADDs I	05	3	21000025
6	CV CADDs II	06	0	21000026
7	CV CADDs III	07	7	21000027
8	CV CADDs IV	08	7	21000028
20	CV CADDs IV-X	25	18	21000029
146	CV CADDs S-X	58	0	21000030
156	CV MEDUSA CAD	64	0	21000031
37	CV/PERSONAL DESIGNER	46	1	21000032
35	DAISY CAD	44	1	22000001
170	DASH CAD	76	1	22000002
154	DATA CAD	61	0	22000003
10	DEC CAD	10	0	22000004
158	DESIGN AIDS CAD	66	0	22000005
143	DESIGNPRO CAD	55	0	22000006
171	DRAFIX CAD	77	4	22000007
28	EAS CAD	36	0	22000008
140	ECAD	51	0	22000009
152	EE DESIGNER CAD	60	1	22000010
164	GENERIC CAD	71	3	22000011
162	GEOMOD CAD	69	0	22000012
11	GERBER CAD	11	0	22000013
12	HEWLETT-PACKARD CAD	13	2	22000014
13	IBM CADAM	14	5	22000015
18	ICEM/DDN/CD2000	22	7	22000016
172	IGI 2100 CAD	78	0	22000017

Appendix TABLE VIII-3-continued

list Record #	DESCRPT	CODE	CNT	MKY
145	INFINITE GRAPHICS (IGI) CAD	57	0	22000018
24	INTERGRAPH CAD	30	5	22000019
34	MCAUTO UGII CAD	43	4	22000020
14	MCAUTO/UNIGRAPHICS CAD	15	4	22000021
32	MENTOR CAD	41	3	22000022
155	MGM (MACINTOSH) CAD	63	2	22000023
161	MINICAD	68	0	22000024
176	ORCAD CAD	81	1	22000025
142	PCAD	54	2	22000026
127	POINTLINE CAD	50	0	22000027
26	PRIME CAD	33	0	22000028
174	PRO CAD	79	0	22000029
163	PROVISION CAD	70	0	22000030
15	REDAC CAD	17	5	22000031
169	SCHEMA CAD	75	3	22000032
19	SCI-CARDS CAD	24	0	22000033
165	SUN CAD	73	0	22000034
16	TEKTRONIX CAD	19	1	22000035
17	TERAK CAD	20	0	22000036
33	TEXAS INSTRUMENTS CAD	42	0	22000037
153	VALID CAE/CAD	62	0	22000038
23	VERSACAD	28	2	22000039
177	ICES CAD	82	1	22000040
112	AUTOCAD SYSTEM OWNER	X1	7	23000001
113	AUTOCAD 2.0 OWNER	X2	1	23000002
114	AUTOCAD 2.15 OWNER	X3	1	23000003
115	AUTOCAD 2.17 OWNER	X4	3	23000004
116	AUTOCAD 2.18 OWNER	X5	1	23000005
117	AUTOCAD 2.5 OWNER	X6	2	23000006
133	AUTOCAD 2.52 OWNER	X7	5	23000007
139	AUTOCAD 2.6 OWNER	X8	2	23000008
150	AUTOCAD 2.62 OWNER	X9	1	23000009
167	AUTOCAD V-9 OWNER	X0	1	23000010
134	AUTOCAD TRAINING	XV	10	23000011
135	AUTOCAD 00-03 MONTHS	XW	8	23000012
136	AUTOCAD 03-12 MONTHS	XX	4	23000013
137	AUTOCAD > 1 YEAR	XY	8	23000014
138	AUTOCAD EXPERT	XZ	2	23000015
118	IBM AT (COMP) OWNER	XA	4	23000016
119	IBM XT (COMP) OWNER	XT	5	23000017
42	CAE	CE	6	24000001
44	CAM	CM	3	24000002
129	CIM	CI	0	24000003
46	FINITE ELEMENT ANALYSIS	FE	3	24000004
65	3M EXPERIENCE	K1	70	25000001
70	AMHOIST/AMCLYDE EXPERIENCE	K6	15	25000002
69	CDC EXPERIENCE	K5	207	25000003
73	DONALDSON'S EXPERIENCE	K1	13	25000004
74	ELLERBE EXPERIENCE	KJ	8	25000005
67	FMC EXPERIENCE	K3	25	25000006
75	GENERAL-MILLS EXPERIENCE	KK	15	25000007
76	GNB EXPERIENCE	KL	7	25000008
66	HONEYWELL EXPERIENCE	K2	126	25000009
72	IBM EXPERIENCE	K9	12	25000010
78	MEDTRONIC EXPERIENCE	KP	17	25000011
77	NSP EXPERIENCE	KN	13	25000012
84	NW BELL/AT & T EXPERIENCE	K0	5	25000013
79	ONAN EXPERIENCE	KS	18	25000014
81	PILLSBURY EXPERIENCE	KV	10	25000015
82	ROSEMOUNT EXPERIENCE	KW	14	25000016
71	TECHPOWER EXPERIENCE	K7	82	25000017
83	THERMO KING EXPERIENCE	KY	5	25000018
80	TORO EXPERIENCE	KT	9	25000019
68	UNISYS EXPERIENCE	K4	125	25000020
122	3M RETIREE	R1	0	25000021
125	CDC RETIREE	R5	5	25000022
123	HONEYWELL RETIREE	R2	11	25000023
121	NW BELL/AT & T RETIREE	R0	0	25000024
124	SPERRY RETIREE	R4	6	25000025
175	NSP RETIREE	RN	0	25000026
178	KEY EMPLOYEE	KE	5	25000027
40	ARTIFICIAL INTELLIGENCE	AI	7	26000001
128	AUTOMATED ASSEMBLY	AA	10	26000002
131	BIPOLAR	BP	2	26000003
43	CALIBRATE	CL	24	26000004
120	CLEAN ROOM	CR	6	26000005
45	CPM	CP	0	26000006
47	GEOMETRIC TOLERANCING	GT	20	26000007
48	HEAT TRANSFER	HT	10	26000008
49	HYDRAULICS	HY	26	26000009

Appendix TABLE VIII-3-continued

list Record #	DESCRIPT	CODE	CNT1	MKY
50	INFRA RED	IR	4	26000010
132	JIT	JT	22	26000011
51	LASER	LA	12	26000012
52	MIL STDS	MS	144	26000013
53	NC/CNC	NC	13	26000014
64	NUCLEAR	NU	5	26000015
54	OPTICS	OP	6	26000016
57	PERT	PR	3	26000017
56	PLC'S	PL	17	26000018
55	PROFESSIONAL ENGINEER	PE	30	26000019
58	ROBOTICS	RB	16	26000020
59	RUBYLITH	RY	1	26000021
130	SURFACE MOUNT	SM	11	26000022
60	THICK FILM	TK	2	26000023
61	THIN FILM	TN	14	26000024
62	VLSI	VL	11	26000025
63	WIRE WRAP	WW	10	26000026
148	EMI/EMC	EM	7	26000027
151	STATISTICAL PROCESS CONTROL	SP	42	26000028
179	UNDERWATER LAB	UL	0	26000029
85	ADA	QA	18	27000001
86	C LANGUAGE	QC	61	27000002
109	COMPUTER GRAPHICS	QG	6	27000003
87	FORTRAN	QF	92	27000004
88	LISP	QL	16	27000005
89	PASCAL	QP	76	27000006
110	REAL-TIME	QR	23	27000007
91	SIMULATION-MODELING	QS	20	27000008
92	TACTICS-MISSION	QT	2	27000009
90	UNIX	QU	38	27000010
160	COMPACT II	CT	0	27000011
168	FORTH	QO	6	27000012
184	DBASE	QD	0	27000013
185	NETWORKING	NE	1	27000014
94	4-BIT	ZB	1	28000001
93	ANAYK	ZA	2	28000002
103	ANUYK	ZU	4	28000003
95	CDC COMPUTERS	ZC	36	28000004
96	DEC COMPUTERS	ZD	38	28000005
97	HEWLETT-PACKARD COMPUTERS	ZH	11	28000006
98	IBM COMPUTERS	ZI	44	28000007
99	IBM PC-XT-AT	ZJ	60	28000008
104	INTEL CHIPS	ZV	54	28000009
105	INTEL 8080	ZW	14	28000010
106	INTEL 8085	ZX	18	28000011
107	INTEL 8086	ZY	17	28000012
108	INTEL 8088	ZZ	9	28000013
147	MACINTOSH COMPUTER	ZK	13	28000014
111	MOTOROLA	ZL	39	28000015
100	MOTOROLA 6800	ZM	11	28000016
101	MOTOROLA 68000	ZN	14	28000017
102	SPERRY-UNIVAC COMPUTERS	ZS	27	28000018
180	ANALOG	AN	29	28000019
173	USE TO FIX EOF ERROR IN GENFM682	--	0	30000001

1. A method of selecting none or more candidates from a database of candidates wherein the database of candidates includes a list of candidates and their respective qualifications, the method comprising the steps of:
  - a. creating a requirement record comprising
    - i. a first plurality of files including fields of information required for contacting a customer;
    - ii. a customer code file which includes a predefined list of certain company names;
    - iii. a job criteria file having fields for recording customer selections of job criteria from a predefined list of selection criteria wherein the list of selection criteria is presented in English;
  - b. if the customer is listed in the customer code file, then creating a database of all candidates having experience with the customer;
  - c. if the customer is not listed in the customer code file, then retaining the contact information;
  - d. selecting any one of a one or more main types of qualifications;
  - e. displaying logically progressively more restrictive qualification selections in response to the selected one of the one or more main types of qualifications;
  - f. selecting any one of the logically progressively more restrictive qualifications and repeating steps e and f until displaying a final menu screen showing a plurality of logically progressively most restrictive qualifications;
  - g. showing on the final menu screen a quantity of candidates available for each of the plurality of logically progressively most restrictive qualifications so as to allow prediction of an outcome of the number of selected candidates;
  - h. repeating steps d through g for selecting none or more other main types of qualifications;
  - i. processing customer selections resulting in an alphabetical display showing candidate names,

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- coded education, length of total experience, and billing rates in a matrix format and indicating by asterisks candidates having customer selected qualifications and reserving a column in the matrix to indicate past experience with the customer;
- j. optionally performing any one or all of the steps of:
- i. broadening qualification selections to increase the quantity of selected candidates;
  - ii. tightening the qualification selections to decrease the quantity of selected candidates;
  - iii. changing qualification selections;
  - iv. viewing resumes of selected candidates;
  - v. deleting a selected candidate from the display; and
- k. creating a record of the displayed matrix.
2. The method of claim 1 further comprising a reverse match process comprising the steps of:
- a. storing the plurality of most restrictive qualifications displayed in step 56.f as a set of finally selected qualifications;
  - b. adding or deleting none or more candidates and the none or more candidates' qualifications to or from

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- the list of candidates to generate a current list of candidates; and
- c. comparing the current list of candidates' qualifications against the finally selected qualifications.
3. The method of claim 1 further comprising a follow-up match process comprising the steps of:
- a. storing the selections of most restrictive qualifications made in steps 56.d through 56.g;
  - b. adding at least one new candidate and the at least one new candidate's qualifications to the list of candidates;
  - c. comparing the at least one new candidate's qualifications against the stored selections;
  - d. determining if the at least one new candidate's qualifications match the stored selections of most restrictive qualifications; and
  - e. if the at least one new candidate's qualifications are determined to match the stored selections of most restrictive qualifications, creating an updated record of the displayed matrix including the at least one new candidate's name, coded education, length or total experience, and billing rates.
- \* \* \* \* \*



UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 5,164,897

DATED : November 17, 1992

INVENTOR(S) : Neil M. Clark, et al

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 4, Line 20, add a --- after the word "files".

Column 4, Line 67, delete the word "employee".

Column 7, Line 60, the word "use" should be --user--.

Column 16, Line 59, the word "ma" should be --may--.

Column 23, Item # 217, the word "EXECUTIVE" should be --EXCHANGE--.

Column 23, Item # 227, the word "OFCICE" should be --OFFICE--.

Column 27, Item # 85, there should be a space between the letters "COMML" and "HVAC".

Signed and Sealed this

Twenty-first Day of December, 1993

Attest:



BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks